

# SUPPLEMENT.

# The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

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No. 2475.—VOL. LIII.

LONDON, SATURDAY, JANUARY 27, 1883.

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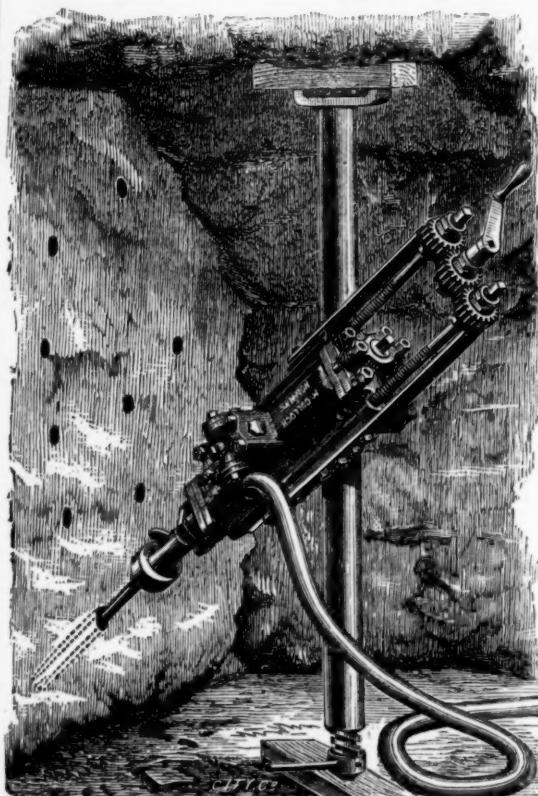


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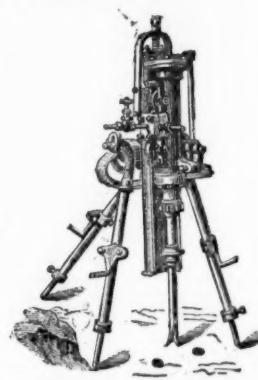
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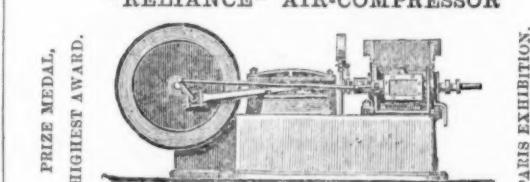
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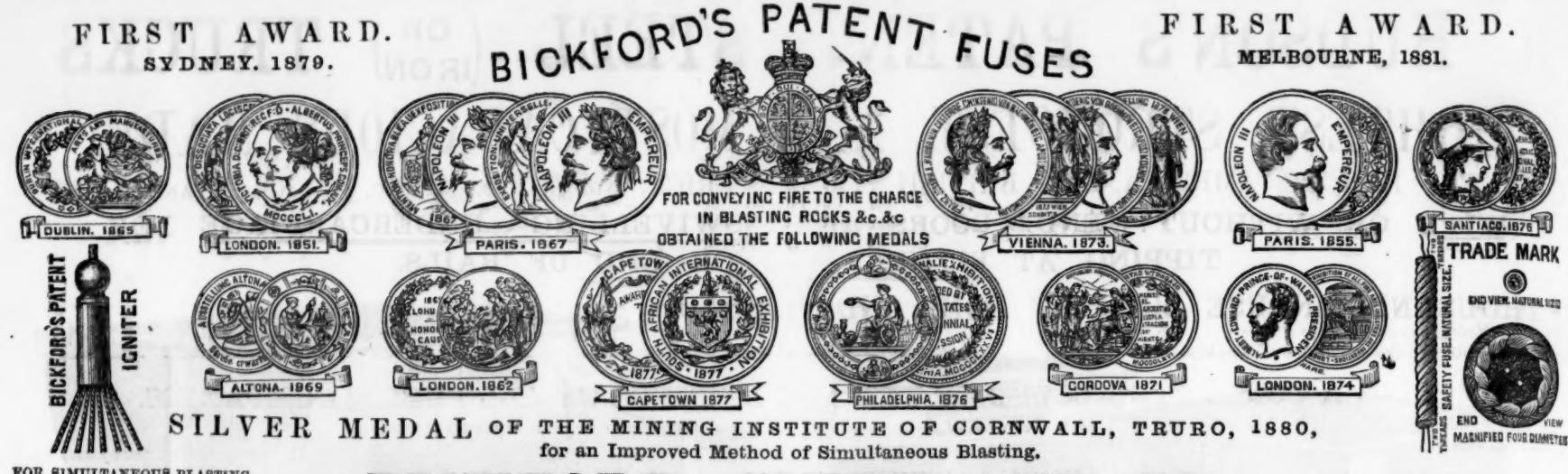
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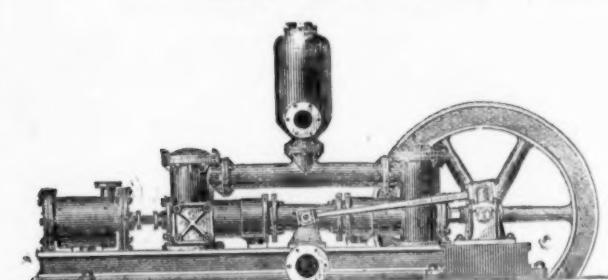
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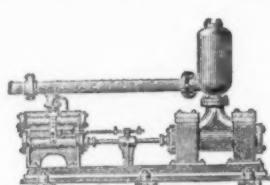


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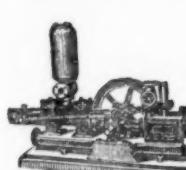
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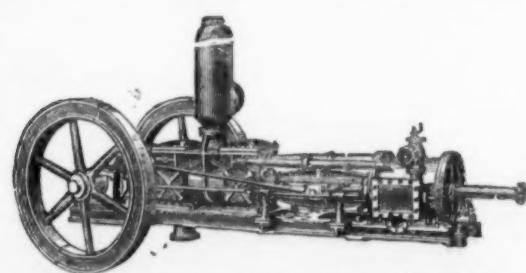
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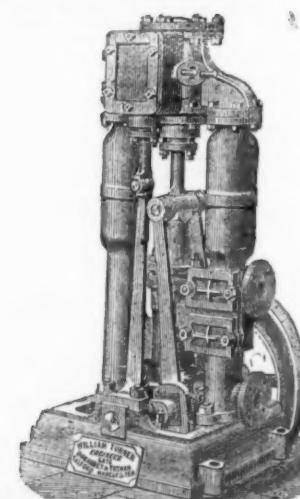
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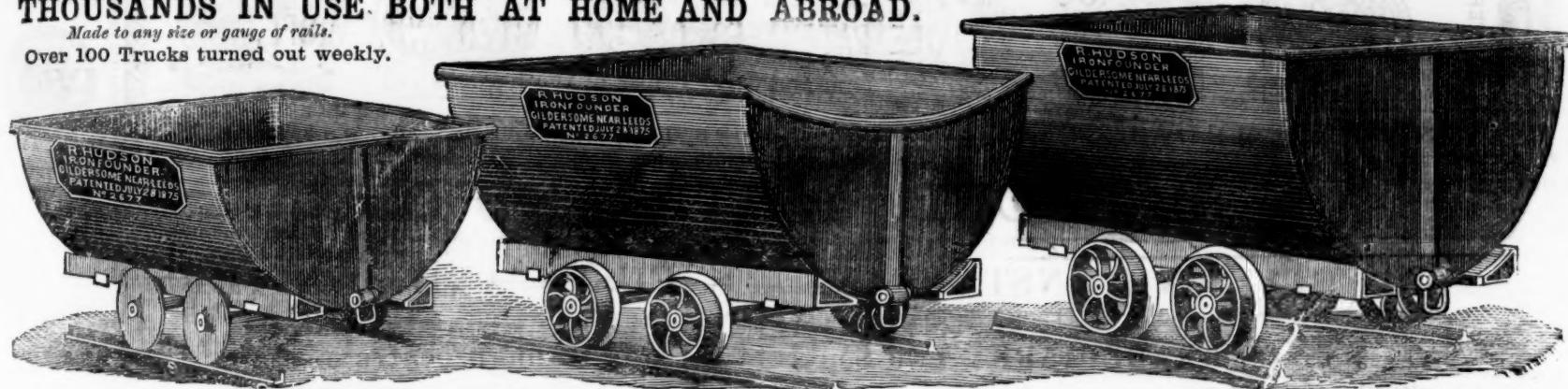
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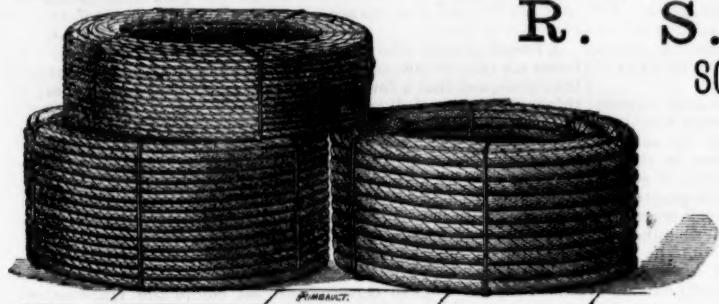
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## FOREIGN MINING AND METALLURGY.

The Belgian iron trade remains in much the same condition. It seems impossible, however, that matters can continue much longer in their present state, having regard to the firmness of coke and pig. Pig is not only very scarce, but also dear. The condition of rolling mills which do not make their own pig, or which have not contracts still pending for the supply of raw material upon cheap terms, has become difficult. The proprietors of rail mills must clearly either advance their rates or the price of pig must fall. Refining pig has made 2*l.* 10*s.* per ton. At this rate ordinary pig should be 2*l.* 6*s.*, and mixed pig 2*l.* 2*s.* per ton. Luxembourg pig stands at 2*l.* 10*s.* per ton. Iron has been quoted at 5*l.* 4*s.* per ton, with the ordinary difference of 8*s.* per ton per number. Girders have been a little less sought after, the weakness of the Paris market having exerted a certain influence. No. 2 plates have made 7*l.* 4*s.* to 7*l.* 8*s.* per ton, and No. 3 8*s.* to 8*l.* 4*s.* per ton. The imports of iron minerals into Belgium in the first 11 months of last year amounted to 1,104,397 tons, as compared with 1,074,543 tons in the corresponding period of 1881. The exports of iron minerals from Belgium in the first 11 months of last year amounted to 300,521 tons, as compared with 336,865 tons in the corresponding period of 1881. Iron rails were exported from Belgium in the first 11 months of last year to the extent of 20,223 tons as compared with 31,095 tons in the corresponding period of 1881. Plates were exported from Belgium in the first 11 months of last year to the extent of 38,170 tons, as compared with 31,548 tons in the corresponding period of 1881.

Prices have ruled rather low upon the Paris iron market. Merchants' iron has made 7*l.* 16*s.* per ton. Some orders have come to hand in the Nord and merchants' iron has been held with firmness in that district at 7*l.* 8*s.* per ton. Plates have also been quoted in the Nord at 9*l.* 4*s.* to 9*l.* 8*s.* per ton. The Creusot Works forwarded last year 2500 tons of steel wire to the Argentine Republic. The imports of iron minerals into France in the first 11 months of last year amounted to 1,264,703 tons, as compared with 1,195,602 tons in the corresponding period of 1881, and 1,076,181 tons in the corresponding period of 1880. In these totals, Spanish iron minerals figured for 440,798 tons, 404,024 tons, and 304,263 tons respectively. The imports of German minerals were 333,826 tons, 297,243 tons, and 258,183 tons respectively. The imports of Algerian minerals were 289,172 tons, 233,685 tons, and 297,073 tons respectively. The exports of iron minerals from France in the first 11 months of last year were 108,801 tons, as compared with 81,924 tons in the corresponding period of 1881, and 104,083 tons in the corresponding period of 1880. It appears that the exports of iron minerals from Lille last year amounted altogether to 3,692,542 tons. The corresponding exports in 1881 were 2,500,532 tons; in 1880, 2,345,698 tons; and in 1879, 1,117,836 tons. There is no change of importance to note in the tone of the German iron markets. Orders have become scarce, but producers have reduced their production, in order to maintain prices, and quotations have experienced no material change. White Westphalian pig has made 2*l.* 6*s.* per ton. The Bochum Steel Works have obtained an order for 2626 tons of steel rails at 12*s.* 7*d.* per ton.

The Belgian coal trade has not presented any change of importance. As the winter advances household coal becomes in less demand, but apart from this the general tone of the market has not varied, and quotations remain at about their former level. It appears from the official returns that the imports of coal into Belgium in the first 11 months of last year amounted to 933,192 tons, as compared with 909,349 tons in the corresponding period of 1881. In these totals German coal figured for 328,680 tons, and 331,571 tons respectively; coal from the Low Countries for 268,634 tons and 225,255 tons respectively; coal from England for 289,193 tons and 228,990 tons respectively; and coal from France for 96,559 tons and 123,342 tons respectively. The imports of coke into Belgium in the first 11 months of last year were 13,994 tons, as compared with 20,731 tons in the corresponding period of 1881. The coke imported into Belgium is obtained principally from Germany and France. The exports of coal from Belgium in the first 11 months of last year were 3,861,586 tons, as compared with 4,065,416 tons in the corresponding period of 1881. The exports to France figured in these totals for 3,649,554 tons and 3,833,346 tons respectively. The exports of coke from Belgium in the first 11 months of this year amounted to 1,000,341 tons, as compared with 827,513 tons in the corresponding period of 1881. In these totals the exports to France figured for 856,193 tons and 707,814 tons respectively. The condition of the German coal trade has not varied materially. Coke and gas coal has been in good demand, while coal for domestic purposes has been neglected.

**WEST AFRICAN GOLD.**—An interesting sample of the gold coming from the mines of the Gold Coast Mining Company (Limited), whose works are at Axim, on the West Coast of Africa has been exhibited in the Exchange newsroom. The precious metal takes the form of a bar, about 6 in. in length, 2 in. in width, and about  $\frac{1}{2}$  in. wide to a certain point. Its weight is about 40 ozs., and its value about 160*l.* The bar, which is of remarkably fine quality, attracted a great deal of attention throughout the day.

*Liverpool Daily Post, Jan. 17.*

**PROVINCIAL STOCKBROKERS' DIRECTORY.**—The third annual edition, for gratuitous circulation, of Messrs. Geo. S. Smith and Co.'s Provincial Stockbrokers' Directory—London: the Authors, Gresham House—has just been issued, and will be found extremely useful to promoters of public companies, since on a single sheet it gives the names and addresses of the stock and share brokers in all the provincial towns. Postal information, stamp duties, and a calendar render the sheet of general utility for reference.

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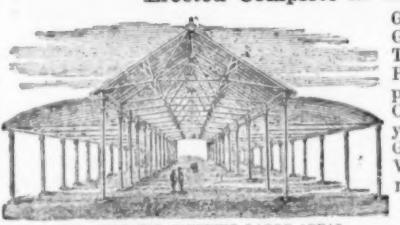
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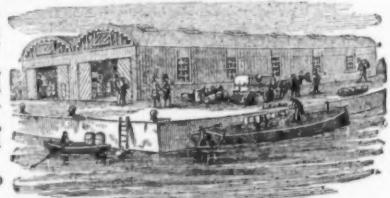
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## Original Correspondence.

## ALLUVIAL GOLD MINING.

SIR,—I see by late numbers of the *Mining Journal* that English capital is being invested in African Gold Coast mines, some of which seem to be principally alluvial ones; the subjoined article, therefore, from the Australian Town and Country Journal on some late discoveries in the Queensland gold fields, and showing how to practically work deep wet ground may possibly be of real use to the parties interested:

The recent discovery of payable gold in the prospectors' claim, Deep Lead, Gympie, will cause the Gympie gold field to become as famous for its yields of alluvial gold as the gold obtained from the quartz reefs in the same locality. The method by which the shaft was sunk and the gold discovered is certainly worth recording; not only on account of the systematic manner by which the manager, Mr. Perry, succeeded in sinking the shaft, but also because the knowledge may be of service to miners in other places knowing of supposed leads of alluvial ground which cannot be bottomed in the ordinary manner. Before describing the manner by which the shaft was bottomed, it will be better, perhaps, if the locality of the discovery is first described and the cause which led the prospectors to undertake the labour.

When the Gympie gold field was first discovered the alluvial gold was got in the numerous gullies and creeks running into the River Mary. The extraordinary richness of the gullies, and the heavy deposits of gold obtained from the Deep Creek, and the numerous points along the bank of the Mary are simply matters of history. Good payable gold was got in the gullies and creeks right down to the river bed. This being so several parties of miners commenced operations upon the alluvial drift at the opposite side of the river. Sundry shafts were started with the intention of discovering the old bed, but in consequence of the heavy water to contend with in sinking the efforts were unsuccessful. It may be mentioned that in the majority of cases the attempt was made to sink with the windlass only. It was about this time that quartz reefing began to occupy serious attention, and the discoveries of so many reefs and heavy gold in the quartz caused the miners sinking the shafts on the bank of the river to abandon the work and turn their attention to quartz mining. In this, as is well known, they were successful in opening up reefs that had paid handsomely for the labour expended, besides establishing the fact that the reefs were permanent.

Although the late Mr. Hackett, the Government Geologist, had predicted the existence of an extensive lead below the drift covering the course of the primary bed of the river; although several other geologists held the same opinion, and many practical miners held the same views, yet in consequence of the knowledge of previous failures, and the fact of the reefs engrossing so much attention, the place remained undisturbed until about a twelvemonth ago, when Mr. Perry appeared. This gentleman had been mining for many years, and had once succeeded in sinking through the wet drift on the Lachlan gold field by means of the diving dress. He prevailed on some people in Gympie and Brisbane to join him in the venture of testing the ground first by boring a series of holes across the drift for the purpose of finding the deep ground or gutter, and then to sink a shaft in the manner indicated above. The holes were bored, and when the deep ground was found a shaft was started. To a depth of 27 ft. the sinking was dry and no difficulties encountered, but at that depth the water and drift were met with. The slabs were then prepared and made into boxes on the surface, and two divers, working four hours shifts, descended and commenced operations beneath the water. By this method there was no necessity of sending up or hauling the water. This was left standing in the shaft, and only the mudlock sent to the surface. At a depth of about 50 ft. (I am not certain as to the exact depths) the drift was penetrated, and a bed of cement met with. The shaft was puddled from this, and the water kept back. Beneath the cement, 3 ft. thick, the headings appeared, and below that the wash. When the bottom was reached it was found to be sloping away down towards the present bed of the river, and although the three loads of wash gave about 2 ozs. of coarse water-worn gold, yet it was considered that the actual gutter was at some distance from the bottom of the shaft.

In order to get to this it was considered advisable to sink down through the rock (slate), so as not to disturb the shaft and let the water in. The slate was sunk through, and a drive started for the gutter. During the driving holes were put up to prick the wash, which was found to be still dipping, and which contained payable gold. At length the wash came down to the roof of the drive, and the first prospect showed 2 dwt. of gold to the dish. Washdrift that will yield 2 dwt. of gold to the dish, or even  $\frac{1}{2}$  dwt. per dish, when the gutter is wide with a good depth of wash, simply means a fortune to the holders, and should the results of the first washing up fulfil the general anticipations the lead will give employment to a large population of miners. It may be mentioned that the prospectors' shaft is fully a mile below where the Deep Creek empties into the river, and taking this as the upper part of the lead, and considering the long stretch of alluvial drift existing below the prospectors' claim a good idea will be arrived at as to the probable extent of the lead.

Several other claims have been taken up since the shaft was first bottomed. No. 1 North are sinking a shaft near the prospectors' boundary. Knowing that the gutter was further towards the river than the shaft on the prospectors' claim the holders of No. 1 North commenced sinking nearer the river. They are now down about 50 ft. in their shaft, and from the depth of drift penetrated they are of opinion that the shaft will bottom in the deepest part of the old bed. No. 2 North are also sinking, and No. 3 North has been pegged out, and the holders about commencing operations. In the claim south of the prospectors the holders are boring to test the deep ground. Most of the claims are held under consolidated miners' rights for 12 in. party. This gives the holders 120 ft. along the lead by a width of 400 ft.

Again and again it should be strongly impressed upon the minds of all investors in mining that a manager with practical knowledge, skill, and honesty, will make even a poor mine pay, therefore in all alluvial and quartz gold mining it is almost an absolute necessity for assuring success, that both the Indian and African gold mines should be opened out and managed by men who have either Australian or Californian experience, as no matter how clever the ordinary English mining captain may be he cannot have the special experience without which any possible success can only be the result of chance or good luck, and no practical man leaves his business profit to depend on either of them.—*Sydney*, Dec. R. D. A.

## MINING IN SOUTH AUSTRALIA.

SIR,—I regret to say that there is but little to write about mining at present, everything of the kind being extremely dull. The old standard mines, the Moonta, the Hamley, and Wallaroo mines are still going on steadily, and turning out large quantities of copper, but with reference to most others—what are called "outside mines"—there is not very much doing. There are one or two exceptions in the far north where the Mount Rose Mine belonging to the English company, and the Corporation of South Australian Copper Mines are turning out splendidly. Twenty years ago I wrote and published a very favourable report on this mine, and during the past few months, in which working has been resumed, the results have fully justified the opinion I then expressed. I enclose the last report, as you may think it worth publishing:—

MOUNT ROSE MINE, Dec. 2, Capt. Tregoweth reports: Engine-shaft: We have made unusually good progress with sinking, having sunk during the month 4 fms. 5 ft. The shaft is now 10 fms. 3 ft. below the lowest level, and 24 fms. from surface, or about 14 fms. below water level. We had a beautiful bunch of ore in the shaft last week, which dipped away out of the shaft north in the same way as the bunch above did, but as the shaft is now down a good lift I purpose opening out the north side, which I hope will give us a good pile of ore, and at the same time the ground worked away will give us room for cutting plat, putting in frame set, &c. No. 2 winze has been sunk during the month 5 fms. 4 ft. and is nearly 8 fms. below the 13 fm. level, but as the water was coming in pretty fast, it has been stopped until the end of the level is driven, so as to drain it. I have put the men to drive from the winze toward the shaft just against the top bunch of ore. We have obtained some good ore while sinking the winze, but it has not been so productive as it promised at first. Thirteen fathom level has been driven east and north over 4 fms. We have broken several bags of ore out of it, and the lode is holding on strong and healthy, and will, I believe, soon improve. I consider we have broken and dressed 30 tons of ore during the month. I have sent away 24 tons, and have still 40 tons on the floors, but having now six teams engaged in carting, I hope to send it down faster; the roads, however, are heavy at present owing to the recent rains.—Dec. 8: I am pleased to say that in stripping out the north side from the bottom of engine-shaft referred to in my last report, the deposit of ore has been even better than I anticipated, in fact it is the best bunch of ore for size and richness that I ever saw during my 30 years' experience in copper mining. Within a week we have broken and hauled from it 15 or 18 tons of 42 per cent. ore. I believe that in stripping out the necessary ground for a good plat, we shall break fully 60 ft. worth of ore. You will, of course, gather from my reports that the lode does not run regular with continuous veins or leaders of ore, as in some localities, neither is the ore mixed up with inferior vein stuff, but when it makes it is rich and clean, and the best feature is to my mind that the deeper we go down the larger and better the bunches of ore are, and the general opinion is that these bunches of rich black oxide and grey ore are sure to lead down to the continuous lode of rich yellow ore.

It will thus be seen that the Mount Rose Mine is becoming an exceedingly valuable property. I believe the cost of carriage of the ore to Port Augusta, by teams and railway, will not exceed 4/- per ton, and such ore as they can raise, at the rates of 15 to 18 tons in a week, will very well stand that price for carriage.

Referring to the Willouran Mine, which was described in my letter published in the *Mining Journal* of Nov. 18, it has not turned out quite so productive to the present time as was then anticipated, but there seems to be a little mystery connected with it which wants clearing up. Early in November a new manager was sent to the mine, and he very shortly after sent down a most unfavourable report, entirely contrary to what had been said by everyone else who had seen the place. At least three large shareholders who had seen the lode, and the quantity of loose copper on the surface, as well as what was broken out and raised from about 7 fms., were astounded to hear from the new captain that he could not find any more ore, and that the lode seemed to be cut out. Two of the original and

largest shareholders, who were also practical miners, who had worked for months on the mine—one of them indeed for years—flatly contradict the assertions of the new manager, and assert most positively that the mine contains one of the richest and most extensive deposits of copper in the colony. I confess that was the opinion I formed of it before it was opened to the extent it now is. In the meantime a few small parcels of ore (about 30 tons) averaging about 25 per cent. of copper have been sent down. It may be taken as some confirmation of the value of the district as an extensive mineral country that a large number of 80 acre sections of mineral land have been taken up on the line of the great Willouran lode, these claims extending in a direction N.W. and S.E. from the Willouran Mine, for a total length of about 14 miles. Many of these have been secured under the direction of some of the most experienced miners in the colony who say, "That country is full of copper." Other very rich lodes have been also found miles away to the westward. A few months will probably prove the value of this part of the country, for several parties intend going to work shortly. The extension of the railway from Farina, the present terminus, to Hergott Springs, about 35 miles farther north, will bring the line within about 10 miles of the Willouran Mine.

No doubt a great deal of mischief is done to the mining interest by the trafficking which is carried on in shares by persons who do it solely as a speculation. For all practical purposes, as far as such parties are concerned, it matters little whether a mine be rich or poor, or even a genuine one at all. A mine in the moon, if shares were quoted on our local exchange, would answer the purpose of these speculators as well as any other. But, owing to their practices, those who invest in mining with a sincere desire of developing the mines too often suffer. In the case of the Willouran Mine the price of shares fell in three days, after the new captain's report came down, from 47 1/2s. to 5s. per share! the sellers being chiefly outsiders holding only a small interest. It will take months of successful working to restore confidence. In our gold mining ventures a few are being perseveringly worked with good prospects of success, and we are promised shortly some improved means of saving the gold, much of which has hitherto undoubtedly been lost. Mr. James Hay, of Adelaide, has lately imported one of Marsden's ore pulverisers, which is likely to prove very useful here as it will crush gold quartz, &c., dry. A recent trial which I witnessed of this crushing machine was very successful, and I consider it may well be brought into competition with the ordinary stampers which require so much water.—*Adelaide*, Dec. J. B. A.

## THE GOLD AND DIAMOND FIELDS OF SOUTH AFRICA.

SIR,—This is likely to be the dullest Christmas that I have ever seen in Kimberley, and my worst predictions with regard to the result of the late company mania has been more than realised—the reason is not far to seek. During the time the mania was at its height the most questionable properties received the most prominent attention, simply because the owners were in a position to gain the attention of capitalists; whereas in many instances really valuable properties have not received the attention they deserve, simply because the social position of the owners precluded them from entering the arena with their more glib neighbours. In referring to this matter I make no reference to the following extremely rich companies in the Kimberley formation—Central, French, British, Standard, Barnato, Rose Innis, South-East and North Block; or, in the De Beers formation, the Schwab's Gully, Baxter's Gully, De Beers Diamond Company, or De Beers Central. These are all companies that cannot be surpassed by a corresponding number of companies in any country in the world at the present time. In referring to the above subject I am guided by a desire to caution all who are interested in the diamond mining industry to avoid the shoals on which this grand industry has been well nigh stranded. The present depression in Kimberley (which really means South Africa) is owing to the indiscriminate promotion of mining companies without drawing the necessary distinction between profitable and prospective mining, and now the panacea for our ills is said to be the indiscriminate amalgamation of all the companies; but the principal promoters of this scheme are well aware that this will afford no material benefit to the diamond fields generally. At the best it can only afford temporary relief to a few companies, and enable the owners of absolutely worthless claims to clear out.

A scheme is on foot for the amalgamation of the Dutoitspan Mine, but not a single idea has been advanced to show how it can in any way benefit this place. The principal reason given for amalgamating the whole of the companies is that it will lessen the cost of management; but this is scarcely correct, for already the companies are too large to be under the immediate supervision of one manager, and in all of the big companies are to be found "floor managers," "claim managers," and various other sub-managers of various degrees—all complaining of being dreadfully overworked.

There is one matter in particular in connection with the amalgamation of the Dutoitspan Mine to which I think it right to call the attention of investors—the promoters of the amalgamation scheme point out that the amalgamation of certain claims by the Central Company in the Kimberley Mine is the cause of their success, but this is far from correct. In the quality of the diamond soil there is no comparison between the two mines—they have no connection with each other, being fully a mile apart. As will be seen from the last balance-sheet of the Kimberley Central Company the cost of raising and rendering their diamonds marketable is over 20s. per load (the actual value is over 40s.), whereas the actual yield of diamonds from the Dutoitspan Mine is below 9s. per load. (The Inspector in his annual report puts it at 4s.) The blue diamond soil cannot be returned at Dutoitspan any cheaper than at Kimberley at a corresponding depth. Seeing that the total value of the diamond soil at Dutoitspan is less than one-half of what it costs to render the diamonds marketable in the best conducted company on these fields it is difficult to see how—with the present low price of diamonds and the ruinous price of fuel, labour, and materials—it can be a profitable mine. One thing is certain—either the Dutoitspan Mine cannot be worked at a profit, or the celebrated Kimberley Mine ought to do a great deal better.

The amalgamation scheme as set forth by a certain party here will ruin Kimberley, and in many cases it is as objectionable as strapping a dead body on to a live one. In the Kimberley formation there has been another fall of reef at the north-east of the mine, in consequence of which the Standard, British, and Barnato Companies are sufferers. The Standard have discharged their floor hands, and I trust it will be three months before they will be able to work on the blue (diamond soil). I should think the British would be clear in five or six weeks, and the Barnato in as many months. The Central and French Companies are hauling very large quantities of diamond soil, and even at the present price of diamonds are earning very large dividends. At Dutoitspan most of the companies are in a sad plight, but this is owing principally to the manner in which they are handicapped. Money throughout the fields is very tight, and there is no doubt if a few capitalists were here at present and carefully watched their opportunity they could make a great deal of money in short time. I know of instances at the present time of companies paying 50 per cent. per annum whose shares are selling 20 per cent. below par. At De Beers, the Baxter's Gully, De Beers Central, Schwab's Gully, and De Beers Mining Companies are doing well, but all the others are still very speculative.

Our electric lights are a dead failure; in the distance they look very much like revolving lights, only they are more irregular in flashing, and there is no doubt that tallow candles would be a decided improvement. On the other hand, the Kimberley water-works scheme is a decided success, and as soon as the water is laid on to all the houses the dividends will not only be regular, but large. There is some talk here of a coal company being formed in England for the purpose of supplying this place with coal from the Free State. This would be a great boon to Kimberley, and would enable many companies to work at a profit that are now working at a loss. Jagersfontein Mine is improving in depth. I have seen some beautiful parcels of diamonds from there lately, and the Messrs. Kerr Brothers are said to be doing very well. I notice that some of your correspondents are of opinion that I am trying to throw cold water on the gold fields, but they never made a greater mistake. I am

extremely anxious in the true interest of South Africa that the gold fields should be properly developed, but this can only be done by representing them in their true character. To represent properties as worth three or four millions of pounds sterling that are only worth from sixty to eighty thousands of pounds sterling is to cripple an enterprise that with careful and honest handling might develop into one of the staple industries of the country. There is not a person in this country who knows the gold fields of the Transvaal better than myself, and I say most hesitatingly that the worst properties are being offered at the highest price, and ought to be avoided. On the other hand, some properties in the Transvaal are placed before the public at a fair and honest price; thus the portion of Spitzkop recently brought out by Mr. C. K. White is well worth the money paid for it, and if the property be properly handled the dividends ought to be substantial and lasting. This is without doubt the best property yet discovered on all the gold fields, and if the four places (two of which are quartz reefs) to which I referred in my letter of Dec. 25 do not turn out traps I am much mistaken.

A friend of mine who returned from the De Kaap gold fields informs me that he saw some very nice nuggets picked out of some of the claims, and that a few old diggers were earning good wages; he thinks it is a small diggings which would pay if there was more water. He says at Pilgrim's Rest the old diggers have been fully compensated, the total amount reaching over 50,000*s*. He speaks highly of Brown's Hill, and says if it can be properly worked it ought to give fair dividends. He visited Waterfall Creek, and speaks favourably of half-a-dozen claims, which he thinks would do very well for 20 or 30 diggers to work on their own account; but he thinks the gold-bearing ground too limited for a company. He says the strings of quartz in Davis's Claim are very rich—in fact, quite as rich as when he visited them 20 months ago. This digging was valued for the English Government just before the Transvaal was given back to the Boers at 50,000*s*. sterling, and my old friend's estimate of the concern agrees with the expert who valued it for Government. The slaughter of Kaffirs around the Transvaal border goes on as lively as ever; but the thermometer being over 100° in the shade I must reserve particulars for my next. CORRESPONDENT. Kimberley, Dec. 24.

## THE TRANSVAAL GOLD FIELDS—EXTRAORDINARY RICH GOLD QUARTZ.

By yesterday's post from Lydenburg Messrs. Hollard and Keet received two or three boxes of gold-bearing quartz, surpassing in richness anything ever before seen in the Transvaal. Some of the lumps of quartz and rotten reef stuff are so rich that there is actually more gold than stone in the lump. This ore comes from the Lydenburg Gold Fields, not from the Kaap, and both Mr. Dunn and Mr. Stuart, two experts who are now on those fields declare they are utterly astonished at the surprising richness of the place. They say it is the richest gold field ever discovered yet. If this be so, it will soon come out, for the farms from which this quartz has been brought are included, we believe, in the concessions already granted. Mr. Hollard intends taking this quartz to Europe and exhibiting it at the International Exhibition in Amsterdam next year. It is sure to create a profound sensation there, as richer and more beautiful specimens of gold-bearing quartz could not often be seen.—*Volkstem*, Dec. 23.

SIR,—I beg leave respectfully but earnestly to request that you will be pleased to allow this letter with the extract at head to be published in the next issue of your valuable and influential Journal, the subject being one of great interest and importance to all connected or concerned with the gold mining industry. And while fully admitting and endorsing the correctness of most of the statements and reports as to the surpassing richness of these gold fields, that have been of late so frequently published in the Transvaal press (notably the Advertiser of Dec. 2 and the Volkstem of Dec. 23), for I find these statements more than confirmed in my private letters from the district to hand by last mail, I wish to say that it cannot be too widely understood and made public that these gold fields are practically closed to working gold diggers, the Government proclamation which extended over a great part of the Lydenburg district, and which gave to individual diggers the right to prospect and dig for gold on private as well as Government lands on taking out a license for that purpose having been rescinded by the Volksraad, and the exclusive mining rights and privileges in and to all minerals on and under these lands granted to certain concessionaires in consideration of fixed yearly payments to the Transvaal Government. And it is in order to prevent, as far as possible, a rush of diggers to these places, probably attracted by the glowing accounts published in the papers, and on arrival only to meet with the most bitter disappointment, that I have sought to enlist the powerful aid of your widely-circulated Journal.

When I was at Pilgrim's Rest, in October last, digging was almost suspended. The miners then there were only waiting to receive the compensation awarded to them for their claims and privileges, which has since been paid, and the claims, &c., ceded to the concessionaire of that part of the Lydenburg Gold Fields; and at Geelhoutboom (Mac Mac), Spitzkop, Graskop, and Waterfall the operations of individual diggers will soon cease (if this is not already the case), and most unfortunate for the men who have been working on these farms, for to use a phrase common amongst diggers, they have been "raking it in," the richness of the ground being "simply marvellous." On the farm Lisbon, or Waterfall, as it is sometimes called, until lately the property of Mr. Hugh Gwynne Owen, the concessionaire, and now in the hands of the South African Syndicate, as I have been informed since my arrival in this country, the numerous quartz leaders rich in veins of gold exposed to view surprised me, and I would ask if all this can be done by manual labour, unaided by machinery, and with only the simplest and most primitive appliances, what different results may be fairly expected when the latest improved gold mining machinery now in course of transport is at work in these places, and the system of hydraulicizing which it is, as I have been given to understand, the intention of the South African Syndicate to bring into use at Lisbon or Waterfall, and on other available farms in which this Syndicate is said to be interested, wherever the system may be found to be practicable; and here I would remark that I am somewhat curious to know more about this, to me, new aid to gold mining, and if it is capable of only half of what is promised for it, then I say that there is great scope for it in the Transvaal. As gold in this country does not fall from the clouds on particular and favoured spots, any more than in other auriferous countries, it is only reasonable to suppose that the precious metal may be found to be distributed through the high ranges of the farms in this district, and I trust that this will soon be fully and fairly tested by the application of this hydraulic power.

In conclusion I wish to state, for the information and guidance of diggers generally, that the only diggings in the Transvaal open to the public are at De Kaap, situated about 50 miles from Lydenburg, in that district, and near to the Crocodile river, where prospecting and digging for gold is permitted by the Boer Government under certain regulations and restrictions, and I can say with perfect confidence that this place and the surrounding country, on private as well as Government lands, show most favourable auriferous indications, both quartz and alluvial, and in all probability will shortly be developed into a large and payable gold field; and it is almost needless to add that this desirable result would be materially assisted and expedited by the introduction of capital, combined with energy, into this much abused and misunderstood Transvaal territory. I write from personal knowledge and observation, being a resident of the Transvaal, having had an official and private experience and connection with the Lydenburg district extending over more than 10 years.

JAS. E. GLINISTER.  
City Bank Chambers, Threadneedle-street.

## INDIAN KINGSTON MINING COMPANY.

SIR,—I should not have trespassed further on your space were it not for the statement contained in "J. M.'s" letter, which appeared in last week's Journal, to the effect that Mr. Moore's experience as a gold mining engineer should have taught him "whether or not the indications were such as to justify him in sinking thousands of pounds in the erection of an expensive mill," as to which I have only to suggest, by way of explanation, that possibly Mr. Moore was not consulted prior to the decision of the directors to erect a mill. Of course, I cannot speak authoritatively upon the point, but I myself am very strongly of opinion that on his appointment Mr. Moore advised the then directors not to send out machinery until he had

visited the estate and seen what was required. If this was so clearly Mr. Moore was not to blame.

With regard to "J. M.'s" query as to my opinion of what the prospects of the Indian Phoenix Gold Mining Company are, and of Mr. Grove, the manager of that company, all I will say in answer to the question, which I consider an improper one, is that I know Mr. Grove very well, and that he is a man possessing practical skill, and is an indefatigable worker. As regards the general question of Indian gold mines, I must decline "J. M.'s" invitation to give a dissertation on their prospects. I am sure, however, that as regards the particular mine referred to, and in which I am a large shareholder, that a committee of enquiry is urgently needed.

Darwen, Lancashire, Jan. 22.

CHARLES GREENWAY,  
Darwen Bank.

#### THE NOUVEAU MONDE GOLD MINING COMPANY OF GUAYANA, VENEZUELA.

SIR.—It may be interesting to many of my long suffering and patient brother shareholders in this mine to know that fresh capital has been found for the working of this property, and it is most probable that milling will commence next month in earnest. The property is in itself one of high merit, and can easily return 2000 or 3000 ozs. of gold per month if properly and systematically worked. I understand that Messrs. John Taylor and Sons have now taken up the matter, and if the manager in Venezuela be well supported we may yet hope to see this mine on the Dividend-paying List during the present year 1883.

A SHAREHOLDER.

#### CALLAO BIS GOLD MINING COMPANY.

SIR.—Much has been written and a great deal said relative to this property, especially during the last few months, but in order that truth may be known I desire to place on record the following facts:—I proceeded to Guayana in October of 1880 as the empowered engineer and manager of the Callao Bis Gold Mining Company. The property was handed over to me by the representative of the vendors (in fact one of the vendors himself) about the 9th day of November of the same year. The shaft now well known as the No. 1 shaft was commenced on Nov. 17, 1880, the prevailing idea in the minds of some being that the Callao vein would be struck at a depth of about 45 ft. Sinking, however, was continued by me to a depth of about 124 ft.; water was struck at 95 ft., but it increased in volume to such an extent that upon reaching the depth above mentioned, I was on Feb. 19, 1881, most reluctantly compelled to suspend the works for want of pumping and winding machinery. I used every endeavour to procure in the district the requisite machinery, but such was not procurable. The work of sinking had, therefore, to be suspended until suitable machinery previously ordered could be procured from England. Not to trouble you with too many details, the machinery did not arrive until the second week in November, 1881, and even then in the most incomplete state, the drum and spur-wheel of the hoisting engine being both missing. At the end of November, 1881, the spur-wheel arrived, though cracked in two places; the drum never did arrive, and I was compelled to manufacture one out of the native timber, thus causing further vexatious delay. On Nov. 6 I received two telegrams from the directors telling me to reduce expenditure to the lowest possible point, to suspend all mine explorations and cutting firewood, and to get mill working. In obedience to these instructions no further work was attempted at the No. 1 shaft with the exception of erecting the boiler and hoisting engine, manufacturing the new drum, plating and strengthening the flans in the spur-wheel, and dropping the Cornish pump. Upon the arrival, on Feb. 6, 1882, of Mr. Francis Leander Davis, one of the directors, I decided, in consultation with him to re-commence the sinking of the No. 1 shaft, though this was in direct opposition to the orders received from the board as per above telegram, and I wrote to the directors in London on the next day as follows:—"No. 1 shaft—Callao vein, I have succeeded in constructing a wooden drum in place of the iron one which should have accompanied the other parts of the hoisting engine. The 5 in. Cornish pump has been dropped, and is now in good working order, and as I hold it to be of the highest importance to proceed with the sinking of this shaft, I am now consulting Mr. Davis in regard to the continuing of this work." I may here mention that from the result of my surveys, and from general observation extending over 15 months, I felt as confident as a miner can be that the No. 1 shaft must strike the Callao vein. In El Callao itself the opinion of almost all was against me in regard to the location of this shaft, and much adverse criticism was caused by my persistency in exploring the ground at this point rather than seek the vein several hundred feet to the westward, so much so indeed that the captain of the Callao Mine sent for Mr. Francis Leander Davis with the express object of pointing out to him how extremely "stubborn" I was in adhering to the No. 1 shaft in preference to taking the advice of the community at large and himself in particular, and sinking another shaft several hundred feet to the westwards. In consequence of this advice Mr. Francis Leander Davis insisted upon my driving two levels east and west from the plan of the No. 3 shaft, a proceeding which I told Mr. Davis was useless waste of money, as results have since proved. I now append various extracts bearing on this subject from letters written by me to the board of directors, with their dates:—"El Callao, Aug. 19, 1881. . . . In the main shaft, drift east, however, at 66 ft., we yesterday struck for the first time quartz, which has a very good appearance, and though much broken up and decomposed is an extremely favourable change in the ground. It has occurred very near the spot, where I have always hoped to meet with, at least indications of the Callao vein . . . ." Sept. 6, 1881. . . . "Since passing through the quartz leader at 66 ft., referred to in my last letter, we met with another string a few feet further on, but as these are both dipping to the westwards I am for the moment powerless to explore them further until we can fork the water from the main shaft." Oct. 6, 1881. "My faith in our main shaft remains unshaken, though I am still waiting with the utmost possible anxiety for the balance of the mine pump, the missing pieces of the hoisting engine, and the boiler fittings and connections." Nov. 6, 1881. "I have also been following the string of quartz referred to in my former letters as having been met with at 66 ft. in the gallery east of the main or No. 1 shaft. It appears to be dipping westwards in the direction of the shaft, and to be similar in character and texture to the quartz of the Callao vein. I tried about 10 lbs. of this quartz yesterday, taken from the lowest portion of the small vein sunk upon it, the result being more favourable than I anticipated, as showing very good and decided colour, possibly equal to about half an ounce of gold to the ton. This cannot be looked upon as otherwise than hopeful, and it is quite fair to expect that we may intersect this leader in the shaft at, perhaps, 150 ft. deep."

Soon after the resumption of the sinking of the main shaft it became apparent that the mine pump was unsuitable for the work it was designed to perform, and that the vertical boiler could not generate sufficient steam to keep the hoisting engine at work. In this emergency I utilised the portable engine from the saw-mill in conjunction with the vertical boiler; but as this engine could not be spared for a continuance I conceived the idea to remove an old boiler which had been left on the property by the old Panama Company, and to place it at the No. 1 shaft. This was successfully achieved, and the sinking of the No. 1 shaft was once more resumed in earnest. During the whole of July's workings the indications of the near proximity of the lode became day by day more favourable, and during the first days of August, 1882, I struck the wall of the Callao vein at a depth of 164 ft. 3 in. from grass.

On Aug. 6, 1882, I received a telegram from the directors recalling Mr. Francis Leander Davis and myself, and ordering the stoppage of all expenditure. I confess I never obeyed any instructions in my life with greater reluctance. In reply I wrote to the directors under date of Aug. 8, 1882, as follows:—"The No. 1 shaft has been now sunk to a depth of 164 ft. 3 in. with such unmistakable evidences of the proximity of the lode that the suspension of this work at this moment is intensely to be regretted."

As a matter of fact I am able positively to corroborate the statement of my having struck the vein, not only by samples taken by me from the wall of the lode at the above depth, but from the fact that after only a very few days' sinking in the beginning of Decem-

ber, 1882, the lode was cut through at a depth of 170 ft. from grass, thus showing uncontestedly that, as the lode is reported 4 ft. thick, I must have been less than 2 ft. from it. The works were suspended from Aug. 9 till the middle of November, 1882, when Captain T. Kitchen, my former mine captain, again returned to his old work and forked out the shaft, with the result made public in the telegram from Trinidad which reached London on or about Dec. 20, 1882.

I feel it a duty which I owe to my professional reputation—with every desire to avoid egotism—to claim for myself the credit of cutting the Callao vein on the Callao Bis property, an act of justice which the directors of the Callao Bis Gold Mining Company, for reasons which may still transpire, have so strenuously and skillfully avoided according to—

C. CAMPBELL DOWNES, A. M. Inst. C.E.,  
Late Resident Engineer and Manager in Venezuela of the Callao Bis  
Gold Mining Company.

#### HYDRAULIC MINING—No. III.

*The Economy of the Process.*—The whole system of working the gold diluvial deposits has been revolutionised by the application of hydraulics. The auriferous earth lying on hills and at some distance above the level of the watercourses would by the ordinary method be excavated by hand and brought to the water; but by the present system the water is brought by aqueducts to the gold deposits, and whole square miles which were previously inaccessible have yielded up their precious metal. It sometimes happens from the irregular distribution of the gold that the upper portions of a deposit do not contain gold enough to be washed by the ordinary methods, and would thus have to be removed at a considerable expense in order to reach the richer portions below. By the hydraulic method, however, the cost of cutting away and excavating is so trifling that there is scarcely any bulk of earth which will not pay the expense of washing down so as to reach the richer deposits beneath. Ground sluicing is the common method of working elevated ground in Victoria. It is, however, not confined to high ground, being often available in creek washings. Its essentials are an ample supply of water and a clear outfall for the material passed through the sluice. The first is not always to be had on the workings either high or low; the second, though usually available for high ground, is seldom so for creek workings. The conditions requisite for the operations of hydraulic mining are much less favourable in Australia than in California, owing to the scarcity of water. In some places water cannot be procured at all, and generally it is necessary to construct long races to convey it to the locality required, several of these hill races being 40 and even 50 miles in length. Nor are the steep banks of auriferous gravel found so widely distributed as in the United States. Where the mining ground is shallow and compact, sluicing is invariably resorted to, but where the ground is deep the hydraulic jet is brought into requisition. The method of washing is, however, the same in both of the systems.

Hydraulic mining it will be observed washes more earth and requires more water than any other kind of mining.\* The number of men employed in a hydraulic claim, however, is relatively small, the water doing nearly all the work. In one of the principal districts (Beechworth) water has always been comparatively scarce, and the "regulation" sluice head small. The ground being of good value there was a ready market for water at a high price, and it was used as often as possible, the tail water of the upper sluice being used for a second one at a somewhat lower level, and so on for as many as six or eight times, with about 12 ft. top of fall for each sluice.

It is not easy to estimate the average cost of washing by the hydraulic process. It needs not only very careful measurement of the bulk of the material removed and of the quantity and pressure of water used, but the nature of the material must be taken into account, whether hard or soft, cemented or loose gravel, sand or clay, the rate of progress varying according to the resistance of the materials to the disintegrating action of the water.

The profits of hydraulic mining are in direct ratio to the quantity of auriferous gravel that can be washed and the quantity of water available for that purpose. Obviously it is better to work a large sluice than a small one if the water and pay-dirt are to be obtained in abundance. Usually the gravel is washed down to the bed-rock in hydraulics, but this is not always practicable, as it sometimes happens that there is no outlet for the water.

The quantity of earth washed per man varies from 20 to 50 cubic yards with the common sluice, and from 50 to 100 yards with the hydraulic. Taking the case of a well-known claim (Allan's) in the above-mentioned district the ground worked was about 30 ft. in depth, chiefly a quartzite gravel, the quantity of water used being 500 gallons per minute, and the inclination of the sluice 1 in 25. Five men were usually employed, and an ordinary day's work was 250 cubic yards, being 50 yards per man per day. The earth washed not only varied in depth but in character, sometimes it consisted almost entirely of gravel, at other times it was principally of a light loamy nature. An average of cost may, however, be arrived at by the daily expenses of this claim which were for labour, five men at 7s. 6d. per day = 17. 17s. 6d.; 600,000 gallons of water at 3d. per gallon = 16s. 8d.; wear and tear, 10s.; total, 37. 4s. 2d.; so that a yield of 1½ of a grain would leave a small profit. The practice of hydraulic mining in Victoria is limited to certain areas. The character of the earths, and the position of the auriferous alluvium, lying as much of it does, at low levels, precludes the general adoption of this method, but with a better and more economical supply of water improved modes of washing will doubtlessly be introduced.

The quantity of water used in a hydraulic claim varies from 40 inches to 3000. With 100 in. of water, costing (say) a little over 27, or 5d. per inch per day, a claim in which 30 cubic yards could be washed in 10 hours, and in which the pay-dirt contained a grain of gold to the cubic foot would yield a net profit of 37. 15s. 6d. One company operating in the Sierra Range used 2000 inches of water for 100 days in washing down 1,000,000 cubic yards of gravel, and obtained at the rate of 1d. per yard from which they cleared 2400. The area of the ground removed was 1100 ft. long, 300 ft. wide, and 80 ft. deep, the quantity of gravel carried down every day being on an average 10,000 cubic yards.†

Professor Silliman, referring to the operations of the Blue Gravel Company's claim in California, states that 17,074,758 cubic yards of water were used to wash 989,165 cubic yards of gravel, so that a cubic yard of earth required about 17½ cubic yards of water, equal to 3486

\* A head of water 500 in. daily for 10 hours is the quantity required for a claim of any magnitude.

† It is the destructive effects upon the surrounding country, notably the agricultural areas in the valleys of the mining regions, resulting from this degradation and distribution of the mining debris, which has given rise to apprehensions of legislative interference. It was not until the great tributaries of the Upper Sacramento River began to fill with debris, so that their beds were unable during the flood season to carry the waters which poured down from the Sierras, that the agriculturists were seriously concerned. From a survey made in 1878-9 it was shown that there are 1742 square miles in the Sacramento Valley subject to overflow. This territory comprises some of the best wheat land in the State. Several of the most important settlements in the interior are situated within the district liable to inundation, and levees are required to protect these towns from the rising waters as well as the land under cultivation. But on several occasions the floods have overtaken them. The California rivers are subject to periodic disturbances from great floods. The filling up of the beds or the streams with debris increases their tendency to overflow. The denudation of forest land in the mountains has also increased the rapidity of their drainage. There are numerous sources, both elemental and local, which contribute to the formation of this debris. But the chief source is mining, and especially hydraulic mining. It is stated that 10,000 tons of pulverised matter find their way daily into the beds of the streams from this source. It is the lighter soils of the hydraulic mines and the tailings from the quartz mills of the mining region which constitute slinkens. The bottom lands of the Feather, Yuba, Bear, and American rivers have received an enormous deposit of slinkens and coarse debris, which is in many places several feet in thickness. The problem of the disposition of this mining debris, and the immediate questions growing out of it, involve such numerous and important interests that the demand for an exhaustive and impartial enquiry into the subject, when brought up for discussion, will, beyond doubt, receive the attention it merits from the administration before any repressive measures are instituted. It must be remembered that the hydraulic companies have secured the necessary water privileges under the State Laws, and a United States patent for the land which includes the diversion of water from its natural courses. In most cases where patents have been issued to hydraulic mining companies the miners have paid the Government for hydraulic deposits double the price of agricultural land. Holding these facts in view it is a rational conclusion that some efficient remedial legislation will be introduced which will have the effect of restraining the mischievous consequences of the present style of working, and, while affording due protection to the interests of the farming community, will yet permit of a better regulated system of hydraulic mining.

gallons. The amount expended by the company for water during 3½ years was £11,452*l.*, or at the rate of 7*d.* per miner's inch.

The economy of the process of hydraulic mining has been sufficiently shown, but there can be no doubt that there is a loss of fine gold in the present operations of washing and sluicing even with the most careful manipulation. This loss has been estimated as high as 20 per cent., but the average amount is probably about 15 per cent., still a large proportion.

The working period or "run" in a hydraulic mine varies from two to ten weeks, a temporary or partial "clean-up" taking place occasionally, and a final clean-up at the end of the season. Cleaning up, which is the separation of the gold, amalgam, and quicksilver from the dirt in the bottom of the sluice, occupies two or three days. After the water has been allowed to run clear the false bottom of the sluice is taken up in sections, and the heavy sand, amalgam, and quicksilver are collected in pans. After separating the sand, the silver and the amalgam from the sluice are put into a buckskin cloth and pressed, so that the liquid metal passes through and the amalgam is retained. The latter is then heated to drive off the mercury, which is done either in an open pan or in a close retort. In the pan the quicksilver is lost, in the retort it is saved. After the quicksilver has been driven off by heat the gold is taken from the retort, refined, stamped and weighed.

The writer would here render his acknowledgments to the following gentlemen to whom he is indebted for useful information—Mr. John S. Hittell and Mr. W. J. Lavington; and to Mr. T. Evans, for extracts from his interesting paper on "Hydraulic Mining in California," published in the Century Magazine. P. A. EAGLE.

Jan. 8.

#### RAMBLES IN MANITOBA.

SIR.—The autumn of 1881 will always be remembered in Winnipeg. This was the beginning of the "boom," and the boom continued from October to April. Perhaps some of my English readers do not know what a boom is, and, therefore, it is well they should be thoroughly versed in our Western phraseology. A boom is a sudden rise in values. It may be a land boom, or a boom in corn, or a boom in oats, or anything. The other day, when Mrs. Langtry was playing "Rosalind" in New York, and there were several other actresses playing the same character, there was a boom in "Rosalinds." The land boom in Winnipeg arose from the opening of such a fertile land as the North-West, and was the consequence of the immigration that took its way to that country. Yet any person living there must have been more than astonished; the residents could hardly credit their senses, and the people that came in with funds and invested their money made immense sums. The excitement in Ontario and Old Canada was so great! Each car load that came in bought land and sold out to the next car load, and thus there was a continual increase in the values. What could have been done? *Ex uno ex parte dice omnes.*

In October I was offered 46 acres near the city for \$325 an acre. It went up in two weeks to \$1000 an acre, and in six weeks it was cut up into lots and selling for about \$1500 an acre. Persons that saw Winnipeg in 1873 can scarcely believe in the immense increase. From a little hamlet it has grown into a city, and is still steadily increasing. Yet the increase in the city itself is only the result of the settlement of the immense fertile country that lies west of it. The railway pushed on past Brandon, 145 miles west of Winnipeg, past Du Appelle, till, at the present time, it is close on the banks of the South Saskatchewan River, about 600 miles west of Winnipeg. Now, a new city is likely to be built on the banks of the South Saskatchewan. Many reasons may be given for this being a first-class city, but the chief are these:—The Canadian Pacific Railway will cross the Saskatchewan at Medicine Flat, and on the banks of this river coal abounds, so that another Pittsburg will arise, and the city of Blackness appear. The black diamonds are sure to produce wealth and activity, and we may have a Canadian Manchester at Medicine Coulee in 100 years from the present. Now is the time to get the land, and the white people would like to get it, only it belongs to the Indians; and so they will have to wait till the Government can pay them for their claim.

Yet another source of wealth is the discovery of petroleum in Manitoba. The freight-rate from Ontario for oil, and the duty on American oil constitute a protection in favour of the Manitoba product, and as soon as it is discovered a new city will spring up. There will be a large immigration into the new city as soon as the petroleum is found. The indications are very good, and there is no reason why a large quantity of oil should not be found, as it is in the same formation with the Athabasca oil country, where the oil exudes from the ground.—Toronto, Jan. 5.

BOURNONITE.

FLOODING OF THE NEW AUSTRALIAN GOLD MINE, CRESWICK, VICTORIA.

SIR.—The most terrible accident which has yet occurred in connection with gold mining in the Australian Colonies occurred on the morning of Dec. 12, 1882, at the claim of the New Australasian Company, Creswick, through the bursting in of a flood of water from the old workings into a prospecting drive that was being driven towards them from the No. 2 shaft. The old workings were supposed to have been 250 feet away, and 38 to 40 ft. above the new reef drive. The manager, Mr. William Nicholas, had caused bores to be put up at intervals to test the accuracy of the plans of the old workings, which had been prepared by a former mining manager, and the last bores appeared to be in sound ground. Early in the morning (about 4:30) the water broke away over the points of the back laths, without any warning, and rapidly increased in volume. H. Reeves, the contractor, and his mate, Wm. Mason, immediately ran to the plat, and thence to the intermediate levels by means of the ladders. In the meantime the water rushed with terrific force into the other workings, about 2500 ft. from the shaft, where 30 men were working at the washdrift faces. A terrible scene then ensued. The platman, seeing the water rising, gave the alarm to John Hodge, captain of the shift, who, with a trucker, named Henry Polglase, ran along the drive and cried to the men, "Water is coming; look out." The water was rushing from the south drift about 5 ft. high, and driving the trucks before it. Hodge and Polglase had great difficulty in finding their way to No. 5 shute or rise from the reef, which is connected with an air drive, about 30 ft. up the shaft, for the ventilation of the mine. The men working in the face over the main drive, on the alarm being given, endeavoured to breast the torrent, but the majority were driven back. Several of the truckers who were in the drive managed to reach No. 5 shute, and were hauled into the air-shaft by Hodge, who could only manage to clutch them by the hair. Two miners (Fisher and Minneer) also reached the place of escape and were saved. The latter says he heard two others (Woods and Chegwin) coming behind him, and the latter cried out, "There's no chance; we had better go back to the workings; we cannot reach No. 5." It is supposed they went back. The workings alluded to are about 30 ft. above the main level, where the water was rushing, and as the water was only about 20 ft. in the shaft at the highest level it is possible they may have escaped, if not suffocated with foul air; but there is reason to believe several men were drowned in the main drive. The following are the names of the men below: Married—John Manley, Jabez Bellingham, Abraham Wyatt, James Monahan, George Balcombe, James Carmoedy, Thomas Chegwin, Edward Dargan, Frederick Fisher, John Crongey, Wm. Tregloan, James Welsh, William Curtis, John Gower, Michael Hayes, James Temby, and William Anderson. Unmarried—Benjamin Bellingham, Patrick Rowen, Edward Wood, Nathaniel Trescotick, Cornelius Quirk, John T. Clifton, John Hodge, jun., Peter Maloney, William Serrrier, and Thomas Corbett.

A most gallant and heroic act is recorded of Jabez Bellingham, who might have escaped by the No. 5 shute, knowing the dangerous position of his comrades in the face of the drives, he said, "I am not going to leave my mates without doing my best to save them, and if I can do so I will." Noble words, and should be engraved in letters of gold on his tombstone. So brave an act, which unfortunately resulted in the loss of his noble life in the endeavour to save his mates, deserves special recognition.

The rush of water soon filled all the lower workings, and rose

20 ft. in the shaft, and the unfortunate men caught in these workings were drowned or suffocated with foul air. The greatest excitement prevailed on Creswick, Ballarat, and other gold fields in the neighbourhood, and mining business paralysed for the time. The scene at the shaft presented a most harrowing description. The wives and children and friends of the unfortunate men were weeping and wringing their hands, while stout brawny miners were overcome by the sad occurrence, and shed bitter tears. The directors and manager, the President and secretary of the Amalgamated Miners' Association, and a large crowd of persons were at the mine during the day, and everything possible was being done to get the water out of the shaft. The engines and pumps were set to work pumping and baling, and it was calculated they were lifting 51,000 gallons of water per hour, but in consequence of the foul air from the old workings being so bad no hopes were entertained of recovering any of the imprisoned miners alive. The account of the foregoing sad disaster in a mine and district I know well is taken from the Melbourne Age.—Dec. 13. — THOMAS CORNISH.

## COLORADO MINING—GILPIN COUNTY.

SIR.—In the summary for the past year of the mining operations on the rich gold belt of Gilpin County, as published by the Daily Register Call, Central City, are a series of authentic accounts and statistics of the leading mines of the district, which augurs well for the continued prosperity of this prolific gold field, the total yield for the year being given as \$2,006,516. It says, "The vast wealth that is hidden away in the bowels of these white-capped mountains is simply beyond computation. The extent of it may not be known for centuries, and probably not then. As the earth is removed the more valuable becomes the ore, and astounding its extent. The capitalists of the old world are beginning to see that there are millions in it, and their agents are constantly appearing in our midst, and securing titles to the best mines and mining property. Across the sea 3 and 4 per cent. is considered a handsome profit for the use of money, and millions of it is loaned at those figures. The men who own it now see that they can invest it in mines that pay from 25 to 100, and even 500 per cent., and sometimes more than that. Many of our best mines are owned and operated by men who never saw them, and were never in this country. They are operated by faithful and trusty agents. There are 27 stamp-mills in the district, with a total number of 987 stamps."

The Gunnell Consolidated Company owns a series of mines, in all 7055 ft. patented property. Prior to 1874 the bullion output on those properties was \$2,500,000, and since then up to the end of the year the yield of gold has been \$1,270,735.

The California Mine.—This splendid productive mine is called the king of all the group of mines on Quartz Hill, and has proved one of the most profitable of any in Gilpin County. Since the present company came into possession of this mine a large amount of substantial work and improvements in machinery and appliances have been effected, requiring considerable time and a large outlay of capital. Miners were put into the mine in August last, since then the following developments have been made:—Drifts, 1040 ft.; winzes sunk, 216 ft.; fathoms of ground removed, 657; giving 5390 tons of ore, having an average value of \$12.65 per ton. This company has lately purchased the Hidden Treasure Mine and their 50 stamp-mills, which adds materially to the value of the property,

The British American Tunnel is starting a four-mile tunnel to cut through a series of mountains intersected with gold veins, including the celebrated Quartz Hill, at a depth from 1500 to 2500 ft.; this, when completed, will be a grand mining enterprise. The capital stock is \$1,000,000, of which \$250,000 will be absorbed in payment for the right of way, mines, mill site, and stamp-mill, to be operated on ores from the veins to be intercepted by the tunnel, leaving \$750,000 for the construction of the work. The operations of a large number of companies are given in detail, mostly showing that great progress is being made in development work, and the average yields of the district of a satisfactory nature.

## BONANZA AND UNION TUNNELS.

These large tunnels form two of the most important enterprises that have been inaugurated in Gilpin County, testing, as they will, when carried out, a wide strip of the rich gold-bearing belt (about  $\frac{1}{2}$  mile) of veins which have been so productive on the surface. The first of these has for its initial point an entrance to Maryland or Bonanza Mountain, which it is designed to penetrate, cutting at right angles all the well-defined veins cropping out at the surface, as well as the blind veins and their feeders. It required much time to fully mature a scheme of such magnitude, and after much time and expense on the part of Mr. T. H. Becker, it was finally successfully carried out by the organisation of a company in New York, headed by gentlemen whose intention it is to develop this and the Union Tunnel opposite, penetrating through Casto Mountain. This belt of veins extends from Central City Hill on the south to Clear Creek on the north.

The present heading of the Bonanza tunnel is in 1109 ft. from its mouth, and has intersected 15 veins on which 1500 ft. of drifting has been already done. The Union tunnel has been driven under Casto Mountain 626 ft., cutting through six veins, on which over 500 ft. of drifting has been done. A rich body of ore has been lately discovered in the south crevice of the Maryland vein, in one place 25 ft. wide, the mineral assaying from \$84 to \$198 per ton. The Bonnell vein where cut by the tunnel gives a splendid showing, the ore having an assay value of over \$200 per ton. Both tunnels are being driven ahead, although not by power drills, the company awaiting the arrival of two new boilers of the capacity of 50-horse power, when Ingersoll's drills will be used, ten of which are now on hand ready for use upon the reception and placement of the new boilers. No stoping is being done on any of the veins crossed by either tunnel. The manager of the properties is bending every effort in opening up and exploring undeveloped veins. The ore taken out in development is piled up at the tunnel entrances for treatment in the future; it is estimated that the company has 5000 tons of ore now on hand, assays from which range very high. Not a pound of the ore has yet been milled or sent to the smelters since the company commenced operations. The company can flatter themselves over one fact, that of having the best and cleanest tunnels in the county; both have a double track, floored and boarded up, with water-way and air pipes underneath. The nitro-glycerine used in the tunnel headings is manufactured by the company on the summit of Maryland Mountain, the blasts being discharged by means of electricity, four batteries being used. The company have displayed the confidence they have in their undertaking proving profitable in the end by quietly going ahead with the work of thoroughly developing all veins found by them.

THOMAS CORNISH, M.E.

## GOLD FIELDS OF VENEZUELA.

SIR.—Your correspondent "W. B." in his remarks on above, says truly that as yet the public (that is the investing public) really do not realise the vast productive richness of that gold-bearing state, but if they would only read up the matter they would find that it would have been just as profitable to invest in a *bona fide* Venezuelan company as in many of the Indian scares now gone to rest; with all their so-called riches El Callao, as we are all aware, has been a remarkable wonder for its richness, but I am thoroughly convinced we will yet see quite its equal, indeed it is just a matter of time. The true character of this field has been thoroughly sifted in law courts in the recent history of a young company, and if there had been any flaw or doubt in the unmistakable evidence then produced that company's existence would have been sealed, but they thoroughly proved the value of their property and its future prospects by documents, and especially by the evidence of their eminent engineer brought home from the mine for that purpose; such facts are worth a bushel of ideas, and, therefore, go to testify in no doubtful manner what may be expected by time from Venezuela. I my time, for it is just a question of time, given that there is little doubt that the New and West Callao Companies will after they have completed their mutual tramway and other necessary works, have a brilliant career; in fact, all the evidence that has been adduced goes to prove such statements which are long will no doubt be amply fulfilled. The lodes are abundantly proved by unmistakable samples

which have been assayed, giving an astonishing result, as Mr. Readwin could testify. I have the fullest confidence in these companies' future from the evidence before me, and, as your correspondent truly states the tramway of the Cape Copper Company made that company what it is, so in like manner I am persuaded it only requires the completion of this valuable auxiliary to accomplish the same for the New and West Callao Companies. It must be remembered these companies are more favourably placed for situation than their namesake in many respects for economical working, and, in short, have everything desirable to make them a profitable enterprise when set agoing. I notice another correspondent, "Argus," complains that it is difficult to get the public to take the right view of stocks. No doubt, as we have seen lately, he speaks truly, or he would not now have the disgrace of the Indian bubble and its lamentable consequences. "Argus" sneers at the result of a telegram, anent the Callao Bis Company, but I take it that it is preferable to hold gold companies shares, with a fair reasonable expectation of good results in time, than silver companies shares on account of their relative value as a precious metal. "Argus" states that not an ounce of gold has as yet been taken out of Callao Bis; but, of course, that does not prove that there never will be, or that the conditions were not favourable to the mine not becoming its name and expectation of a gold mine. The result of the telegram goes to prove that the knowing public were watching their time whenever the paying point was reached. And they will likely very well know also what recuperative power the mine has got, if merely fairly successful owing to the vast difference in money value of gold to silver. For "Argus'" information I may state there will be a meeting held shortly of the New Callao Company shareholders. And, as he seems one of these investigating investors, he would do well to weigh the remarks then made, and if he ascertains the remarks are in truth facts, he should, and, indeed, could not do better than sell his silver for gold shares of this company which must shortly be more valuable to him than these he now holds. I cannot say more seeing I am giving it gratis, and when such advice is generally not reckoned anything.—Leith, Jan. 20. — W. B., No. 2.

## FRONTINO AND BOLIVIA GOLD MINING COMPANY.

SIR.—The shareholders of this company are this morning favoured by a circular from Mr. William B. Young, Mr. Richard Donagan, and Mr. C. Frederick Lowe, advocating—1. That the interests of the company are very inadequately represented at the board,—2. That the time has arrived when the board ought to be re-constituted, and 3. The election of two of themselves (Mr. Donagan and Mr. Lowe) to seats at the board. And they further state that at a meeting which was held at the company's office, Jan. 9, Mr. Foakes gave an assurance that he would not seek re-election at the forthcoming general meeting. The part which I have hitherto taken in the affairs of the company is my ground for now seeking to address the shareholders through the Journal. First let me point out that the three gentlemen now moving were till some short time back supporters of the board, whilst Mr. Donagan became Mr. Foakes's scrutineer at the poll taken at one of the recent meetings. How comes it then that they have completely turned round upon the board? I do not doubt they are justified in calling upon Mr. Foakes to resign. I referred to a step of that kind in my letter published in your issue of Aug. 19 last as necessary to the company's interests; but why do not Messrs. Young, Donagan, and Lowe tell us the circumstances which have led them to see that the interests of the company were not adequately represented at the board and that Mr. Foakes ought to resign?

Neither do I dispute the propriety of re-constituting the board. It is part of the policy I and my friends have all along advocated and which Messrs. Young, Donagan and Lowe for a time opposed. In my letter, published in your issue of Oct. 14 last, I pointed out features in the affairs and management of the company which were *not* satisfactory, and I stated that "I had little doubt in my own mind there is detail in connection with the company's affairs that requires scrutiny." I am more than ever convinced that this is the case.

Will Messrs. Young, Donagan and Lowe tell us all they know and how they have been converted to a part of the policy I and my friends adopted and which for a time they opposed? As to the future, let me warn the shareholders to take advantage of the present opportunity. It is evident that the board must be remodelled at once and that some of the present members must go. Now concurrently with this being done I advise them to have a thorough and sweeping investigation into the past management and the dealings with the company's properties and those adjoining. And I further advise them that if they but now get a board composed of men in whose capacity and management reliance can be placed, they will soon see such an improvement in the value of their shares and the amount of their dividends as will surprise them, but such as without these alterations they will not see.

Whether Messrs. Donagan and Lowe are the right men for the office of director is for the shareholders to decide. They do not tell us what has turned them, nor what circumstances have come to their knowledge which has led them to think that the interests of the company were inadequately represented at the board, nor why the time has now arrived when the board ought to be reconstituted, nor why Mr. Foakes was required to give an assurance that he would not seek for re-election.—*Sergeants' Inn, Temple, Jan. 19.*

S. S. SEAL.

## PIERREFITTE MINING COMPANY.

SIR.—I had not read Mr. George Rickard's letter in the Journal of Jan. 13 on the above before it was too late for reply last week, and as he has gone very fully into what he has done at Pierrefitte it seems a pity he did not tell all and confine himself to what he knew, which would have given a very different appearance to his story. One thing is now clear. Mr. Rickard claims all the credit for the machinery erected at Pierrefitte; this I was not sure about before, and he is welcome to it, and I must give him credit also for the rejection of my plans which he condemned untried at Pierrefitte, although so successful elsewhere, and substituted his own, which did not answer, so it appears, otherwise they would not have been removed; but both myself and the company know the result of Mr. Rickard's plans, and have paid for the knowledge. I will content myself on the present occasion by referring to one or two matters illustrative of Mr. Rickard's carelessness as to facts and want of knowledge on the subject of dressing ores. Referring to machinery I sold from the Old Bog to Shepherds, he says it gave 100 per cent. worse results with the man I sent to work it than by the company's own dressers. I do not know what Mr. Rickard means by 100 per cent., but will suppose he means incomparably better results. If so the company ought to have been very well satisfied, because the man I sent had worked the identical machinery for 10 years, and successfully at the waste heaps of the Old Bog Mine, Shropshire, and your readers will easily judge that it was quite likely that he knew something about it, quite as much as those who had never worked it or similar machines before. As regards the results at Shepherds, the experiment of working the waste heaps did not prove remunerative, not from any defect in the machinery or its suitability for the work, as was the case with Mr. Rickard's at Pierrefitte, but from the fact that it only contained 20 lbs of lead ore to the ton, and if all the contents were extracted, which is never the case, it would not pay, but when fresh and valuable ore is raised from the mine, which it is likely will be shortly if not already, the value of self-acting machinery for dressing will manifest itself at Shepherds as elsewhere, notwithstanding Mr. Rickard and his informant. Mr. Rickard failed to make the Pierrefitte ore pay although he reported it worth 2, 4, and 6 tons and upwards per fathom. He seems to catch at a straw, and anything will do for him to say. His representations go to show, although he avoids saying so, that I have supplied Pierrefitte with dressing machinery, but this is entirely untrue. I have supplied that company with no dressing machinery of any kind, and the failures belong to those who have designed and made it, and Mr. George Rickard is one of those by his own claiming, and if that is not the reason why mortgages instead of dividends are being made I do not know what is. The man who has gone as a dresser is not and does not profess to be an engineer, but he knows quite as much about dressing as either Mr. Rickard or most people who profess a great

deal. I did not send him out, but I know the man, and if he has tools to do the work he will do it if it can be done; the Chairman of the company and the shareholders may depend on that.

It is a mean thing to cast dirt on people you do not know, and to say the least of it Mr. Rickard's unprovoked attack on myself and others, although it seems a part of his glorification of himself, is as mean as it was uncalled for, and his inferences and allusions are simply misleading and untrue, and there is ample proof of this at hand. I may find it necessary to be a little plainer at future time. My dressing machinery does not require puffing up, and it is out of Mr. Rickard's power to write it down, and this he will admit when he knows a little more about it than he does at present.

GEORGE GREEN (per HENRY FRANCIS).

Aberystwith, Jan. 22.

## GOLD AMALGAMATION.

SIR.—It seems a trifle awry of Mr. F. Anderson, after getting hundreds of pounds worth of gold with the Britten pan, to treat it so ungraciously. In my recent communications will be found explanations of sundry points of his letter. In the Britten-Readwin pan I have, to a large extent, done away with the wear and tear appertaining to the parent pan.

As to Mr. Anderson's assertion that my improvements will never come into practical use, I venture to say that he, too, prophesies before he knows. I believe that at one time Mr. Anderson would have gone anywhere, anywhere, for the purpose of using the (to him) objectionable apparatus. I do not wish to rub against his susceptibilities at all; but I think he should be careful what he writes and how he writes it; for it seems odd that he should first condemn the objects of his aversion to the tune of the Capulets, and then write of them in epitaph as follows:—"When carefully attended to and not over-fed they save the greater portion of the free gold in the ore." This is true.

Mr. Anderson writes, "there are several modes of preparing quicksilver." He might have said many modes. He adds that "none of them are permanent in their effects." There's the rub! He further says that "Crookes's sodium answers the purpose, perhaps, best of any." He has not, however, yet tried my quicksilver, and that may be the reason why he interjects his convenient "perhaps."

Now, if Mr. Anderson will trouble himself to look at Crookes and Röhrig's Metallurgy (1868) Vol. I., p. 350, he will find it thus written by my friend Mr. Crookes himself, "The best proportion of amalgama to the quicksilver must be found out by experiment, as nearly every kind of ore will require a different treatment." A fact, I believe, undoubted. I have never spoken or written against Crookes's amalgam, for I think that in its infancy I experimented more with it than anybody else, and, consequently, knew then more of its effects than most people; certainly more than Mr. Anderson knew.

In conjunction with Mr. David Spence, F.C.S., I made lots of experiments on the very spot in Wales where Mr. Anderson gained his experience, and Mr. Crookes, without my knowledge till years afterwards, did me the honour of quoting some of them in the book above referred to, at page 359. About the same time Mr. Crookes had a crucial test of his own amalgam himself at the then rich Clogau Mine, and got altogether baffled with bismuthine, and tetradymite, losing a lot of quicksilver and gold too.

Sodium and potassium and other metals may be made to produce strangely uncertain and extraordinary effects with quicksilver. Everybody knows this; but, in Mr. Crookes's own showing, the man has yet to be found who shall know how to use them uniformly in amalgamation processes. Such use involves long and especial training, and varied technical experiences. And where are to be had the special trainers in the occult art?

I hope no further offence; but I fancy "I have hit upon an economical method of doing the desired work, practically, without technical difficulty of any kind, requiring only unskilled labour and one uniform line of treatment for mixed ores, instead of the many different modes referred to by Mr. Crookes." In conclusion, allow me to express a hope that your readers who happen to interest themselves in this question will note carefully the reasonable remarks of your correspondent, Mr. Bryan Tyson. — T. A. READWIN, F.G.S.

London, Jan. 23.

## ELECTRICITY.

SIR.—From the numerous improvements daily made it appears likely that electricity will become light, heat, and power. But there is a very serious question to be asked—Let us suppose that every city, town, and village in the world used electricity, which is likely, what would be the effect on animal and vegetable life by the extraction and consumption of such an enormous quantity of fluid?

In other words what would be the effect, if any, on the atmosphere of this world, as it is reasonable to suppose that the extraction and consumption of this very important natural element would not be without some very changeable, perhaps damaging results.

Rosemount, Jersey, Jan. 22.

HENRICKUS.

## ELECTRIC LIGHTING.

SIR.—The mining interest cannot be indifferent to electric lighting, and, therefore, I send you my experience as to whether a single lamp can be used out of many without working the entire machinery requisite for the whole. I have been staying with a friend in a country house where the electric capacity is equal to at least 300 incandescent lamps of 20 candles each. The drawing-room and dining-room have each a centre pendant lamp and side lights as well, which are separately turned on and off at will in an instant of time. The entrance hall, passages, offices, stables, &c., are all lighted in the same way, and each and all can have their lights lowered, raised, or extinguished as it suits for the moment. All this is done by the use of a storage battery. Now there is a feature of economy in this not hitherto noticed—as one room is quitted for another the lights are turned off, and again turned on when returning. The point is that when lighting direct from the engine any excess of current must go somewhere, whereas with a storage battery no excess or requirement can arise as demand precedes supply. One-half of our gas and oil bills is caused by our unwillingness to turn out lights in consequence of the annoyance of relighting and lucifer matches. Electric lighting saves all that waste.

J. D. SHAKESPEAR,

M.Soc.T.E. and of Electricians.

## THE VALUE OF A GOOD MINE.

SIR.—That things are depressed all round in the mining world is beyond doubt, particularly so in regard to home lead mining. Promising speculations are also too often running short of capital, and the only alternative before them is to wind up, since the disheartened shareholders refuse to supply further funds to carry on until better times. That such mines "on their last legs," as it were, should command but a small market value is not surprising, and only to be expected. But what appears puzzling and unaccountable is to see the ridiculously low prices at which shares in some first-class mining companies are quoted, many of them selling at less than one-half the value of the plant and machinery. I could give instances of several, one however must suffice for the present. In this case the company is in 9000 shares of 1*l*. 10*s*, fully paid up (these shares were saleable at 4*l*. each two years since, and dividends being paid), can be purchased at 12*s*. 6*d*. per share, or 562*5l*. for the property, including the mine, with its large reserves of silver-lead ore, and the valuable plant and machinery. But what is the financial state of the company? During the past year ending Dec. 4, 1882, 540 tons of silver-lead ore have been sold, realising 778*3l*. and 197 tons of copper ore, realising 690*l*, making the total sales 847*3l*. And with what result? The actual profit on the year's working amounted to 510*7l*, and a balance of assets over all liabilities of 1116*7l*, which can be verified by the balance-sheet issued to shareholders for the annual meeting to be held on Jan. 29.

Surely this is not a bad result, considering the fearfully low price lead has fallen to; yet, notwithstanding the profit made during the past year's working, and the fact that the mine is looking well, and the returns of ore likely to increase rather than diminish, this splendid property is at the present time only worth in the market the trifling sum of 562*5l*. If these shares are not a bargain I know of none that are, and I challenge anyone to point out a cheaper investment, and

the wise man who picks up shares with the intention of holding a few months must make splendid profits. The real value of such a property is at the very least 2*l.* per share, or 18,000*l.*

Why it is that shares are so low may be owing to the real merits of the mine being unknown to the mining investor. I can think of no other cause. Possibly other of your readers may be as much in a dilemma as to the cause of the low price of these shares as I am.

GARNINA.

#### LONDON COAL SUPPLY.

SIR.—In a gigantic undertaking, the monopoly of the London coal supply by the Midland coal field, through an immense reduction in price to the consumer, as shown in the sequel, and consequent augmented consumption, at a saving of upwards of 5,000,000*l.* sterling annually to the metropolitan public, due weight is attached to your powerful axis being thrown over any measure tending to the amelioration of the chronic state of extreme depression of the most important industry of the United Kingdom through sheer want of economical transport. Wherefore with the expression of my unfeigned appreciation of the deep interest you have on all occasions evinced, I humbly flatter myself I am not encroaching too far on your valuable space with the annexed revised and amended matter.

*Little Tower Street, Jan. 17.*

W. J. THOMPSON.

#### SEA AND SACK BORNE COAL COMPANY (LIMITED).

Incorporated under the Companies Acts 1862 to 1880.

Capital 5,100,000*l.*, in 510,000 shares of 10*l.* each, apportioned as follows:—

250,000*l.* Perpetual Preference Shares, bearing a preferential dividend of 6 per cent. per annum, non-contingent on profits.

260,000*l.* Ordinary Shares; 10*s.* per share payable on application; 10*s.* per share payable on allotment; with intervals of two months' notice for further calls, not exceeding 1*l.* each.

1,700,000*l.* in 5 per cent. per annum debentures, payable in the proportion of 1 per cent. on application and the balance on allotment; the issue restricted to one-third of amount of shares for the time being allotted.

#### PROSPECTUS.

The primary object of this undertaking embraces the purchase of entire colliery outputs in Yorkshire, Derbyshire, and Nottinghamshire, also of coke, concomitant with their transport at a greatly reduced cost from pitmouth and ovens, and vend in London, Paris, and elsewhere.

The outcome of rigorous calculation, based on practical data, denotes a net dividend accruing on invested capital of over cent. per cent., from sales effected at the, in London, unheard-of low price of under 16*s.* 6*d.* a ton, delivered into consumers' cellars, for a category and quality selling during a lengthened period at 25*s.*, and by sinking less than a moiety of said profit, equivalent to the entire sea and railway charge, all such transport will be irreparably displaced.

As a proof that this view is supported by the highest authorities in this specialty, editorial articles of the leading organs of the coal trade, *Mining Journal* and *Colliery Guardian*, with the no less weighty organ of the Engineer, gives expression to the identical consensus of opinion, one of them stating—"proposed system will extinguish existing rail and sea transit to London, and revolutionise the London coal trade." The import into London last year was 10,380,775 tons, constituting the largest transport in the world.

The Midland and Great Northern terrific loss, at the rate of 300,000*l.* a year in the carriage of coal to London, *vide* the Times City article, June 5, 1871, did not involve a greater reduction of their coal rates to London than 3*s.* 1*d.* per ton, *vide* Mr. Allport's evidence on March 25, 1878. It does not, therefore, require much reflection to forecast a cataclysm, when their entire coal revenue from London coal traffic is swept away by this company.

Mr. Allport admitted, before a Parliamentary Committee, on March 25, 1878, that the Midland shares fell from 190*l.* to 32*l.*, consequent upon their contest with the Great Northern. The statement of the chairman of the London and North-Western on Oct. 1871, of Mr. Allport on June 9, 1865, of the general manager of the Great Northern on April 11, 1878, of the chairman and general manager of Great Eastern on March 8 and 9, 1878, of the largest London coal importer on April 2, 1878, of the leading railway counsel on April 5, 1878, and other evidence of too prolix a nature, prove the impossibility of railways attempting to compete successfully with the water transit.

The supply of the Metropolis with coal upon a gigantic scale was inaugurated by the Great Northern Railway Company not merely as carriers in their legitimate capacity, but as coal merchants, its suppression being assigned in their general manager's evidence in answer to question 12,639 of the Royal Commission on railways thus—"At one time we were coal merchants, but some members of the coal trade brought the matter before chancery, and we were debarred from dealing in coals, resulting in the public having to pay 3*s.* a ton more for their coals." To attain an amelioration of existing cost of transport with which the industries, commerce, and general consuming public are mulcted, it is indispensable to resort to means beyond the control of Parliament, from which source the Great Northern and all railway companies derive their concessions. The proposed company is under no such jurisdiction. No similar large company has taken its place, the coal traffic being worked by innumerable, increasingly so, coal merchants, dealers, but comparatively few coal-owners, at a great disadvantage as compared with the capability of a large company, possessing improved means of economic transport and delivery throughout. It is a well-known fact that the cost of conveyance, with attendant expenses inseparable from the transport, the largest in the world, by far exceeds the prime cost of the coal at pit mouth, the grand factors requiring amelioration being by no means the coal, but the cost of conveyance and London coal merchants' charges, the latter alone 10*s.* to 11*s.* a ton in excess of cost of coal and conveyance, as per the following circular of the North of England United Coal Trade Association, Newcastle-on-Tyne, addressed especially to London coal consumers, and inserted in the Times:—"It is really desirable the public should know they are being charged about 10*s.* to 11*s.* a ton in excess of the net cost of coal and conveyance to London coal merchants." But a much stronger case is made out by the representative of the South Yorkshire Miners' Association, who gave evidence before the Select Committee on Coal:—"If you want cheap coal in London the railway system, as well as that of coal merchants, must be broken up. I have proof of one such realising a profit of 20*s.* a ton on 1500 tons of coal." Sir Edward Watkins' evidence before the Committee on the 1871 Coal Bill demonstrated "the immense influence of a reduction in price in the consumption of coal, amounting in a very few years in London to an increase of 600 to 700 per cent." The result of the proposed reduction will be an immeasurably augmented consumption.

Steam coal will find a ready market in France at highly remunerative prices, the largest, oldest, and wealthiest firm of coal importers and merchants in Paris; simultaneously colliery owners in Belgium possessing the largest waterside coal wharves, provided with tramways and trucks, with the largest number of horses and carts, penetrated with the conviction that English coal by means of proposed conveyance can be delivered in Paris much cheaper than indigenous or Belgian coal, are prepared to act as the company's agents, and to guarantee all sales. The late Mr. Seymour Clarke, general manager of the Great Northern Railway Company, writes thus as to the supply of Paris: "The coal traffic to Paris may be carried to any extent, your calculations showing a very great reduction upon existing high price." A French Government report shows that the entire supply of Paris with English coal resolves itself into a simple question of reduced cost of transport." The *Mining Journal* of Aug. 5, 1876, states "With reduced cost of transit it is practically impossible for Belgian coal now supplying Paris to compete with English." The result of a meeting at the office of the Chairman of the South Yorkshire and North Derbyshire Coalowners' Association shows that English steam coal was selling currently in Paris at 48*s.* a ton, identical quality and category, only costing under 26*s.* delivered to consumers' premises, by proposed system." The enormous proportion of slack, smudge, or small in the Belgian and French outputs renders the large coal much dearer at the pitmouth than English coal delivered in Paris by proposed system; whilst the largest colliery and screw collier owner in the United Kingdom states, "Your system of supplying Paris with English coal is the only feasible one."

As to the supply of steam coal to the Baltic and elsewhere, the cost of the coal f.o.b. in the Humber is much under that of either Hull or Grimsby, and the much larger cargo capacity of the steamers renders competition impracticable from those ports. It is unnecessary to state the supply of excellent steam coal to the London steam shipping, as well as for export will be placed on a footing commensurate with the great advantages from steam coal being put into bunkers free of small. By the acquisition of steamers of a vastly augmented cargo capacity, carrying coal in sacks filled at pitmouth by the company's men, ensuring immunity from breakage, amounting, according to the evidence of the two leading London coal merchants before the Select Committee on Coal, to more than 25 per cent. of the prime cost, the general manager of the reputed wealthiest Yorkshire coalowner stating in evidence before a Parliamentary Committee on March 18, 1878, "We smash the coal all to pieces on shipment," the terrific pulverisation and disintegration of the tender Durham coal requiring no comment. Further dispatch in loading and discharging in harmony with the evidence of the Thames Traffic Committee, provided with hydraulic cranes ensuring immeasurably greater dispatch than the derrick or any other system navigated at a low speed recommended by the highest practical authorities—Robt. Stephenson, M.P., J. Scott Russell, Bidder, Hawkshaw, Fowler, C. M. Palmer, M.P., for North Durham, Humphreys, &c.—at the discussion of a paper read at the Institution of Civil Engineers on the "Cost of Transit by Screw Colliers," when the sea carriage of coal at 9 to 10 knots was declared absurd—Mr. Stephenson favouring four miles an hour, attaching importance to dispatch in loading and discharging, which forms an important feature in the company's programme, whereby the minimum of working expenses is attained. The statistical Congress at St. Petersburg, in August, 1872, stated "It is notorious heavy traffic can be worked to the greatest advantage at a low speed." Sir Thomas Brassey's (Lord of the Admiralty) pamphlet shows that 1*½* knots increased speed entailed in four different ships an additional expenditure of fuel to the extent of 47*½* per cent. The proportionate cost of wages to fuel has been thoroughly worked out, the immense advantage of low speed in the conveyance of coal being uncontested.

During the summer months' reduced consumption of household coal, for which, as well as for fogs and contingencies, due allowance has been made, the steamers will be employed in carrying mining timber, firewood, &c., purchased direct from forest owners in the North of Europe, for which the company will have an assured sale at remunerative prices, colliery owners refusing to purchase such except by the vendors taking coal in payment, a traffic quite foreign to the Hull and Grimsby wood importers, but which forms an important branch of this company's business, possessing their own steamers. The managing director, Mr. William Joseph Thompson, is dependent upon the profits of the company for his remuneration, he undertaking to defray all charges of management at a fixed sum. Parliamentary expenses not to exceed 2*½* per cent. on amount of capital, payable in same manner out of profits of the undertaking, after, in both cases, distribution of 10 per cent. to shareholders.

#### MINE MANAGERS' PLURALITIES.

SIR.—When the manager of a mine becomes successful he is employed, in many cases, to undertake the management of others. The late Capt. Joseph Lyle was successful in Carn Brea Mines (previously called Wheal Fanny, Druids, &c.), he afterwards set North Basset to work, and was successful there also. Also in Wheal Julia, West Basset, Relistian, and Great Hewas; but in Carvanel, Wheal Agar, Godolphin, Wheal Grenville, Bolennoe, Wheal Kitty, South Dolcoath, and Duffield Mines he was not successful.

The late Mr. F. Pryor, of Redruth, was in the receipt of 1000*l.* per annum from salaries of the mines of which he was manager and purser. I remember some of them—West Caradon, Holmbush, North Downs, Tincroft, St. Day United, New Treleigh, Stray Park, North Frances, and several others.

The late Capt. Thomas Richards, Redruth, had under his control at one time about 15 mines—Great Wheal Alfred, West Alfred, Treleath, Wheal Squire (St. Erth), Prosper United, Wheal Bassett, Wheal Trefusis, East Buller, St. Aubyn United, &c. Capt. Richards was said to be a very intelligent miner, but he was rather conceited, for he would never consult his under agents as to any work in the mine. He would fix the price to be paid to the men, and everything else, independently of them. This is very different from managers in general.

The late Capt. Thomas Teague, of Redruth, who made a fortune in Tresavean Mine, worked several other mines. The first mine that I know of his was Wheal Trumpet, in Wendron, which was rich in tin for many years. With the profit derived from this mine, he carried on the works in Tresavean till that mine became self-sustaining. Afterwards the profits therefrom amounted to nearly half-a-million sterling. Capt. Teague was so speculative that he left at his death very little of his gains. I knew Wheal Trumpet in 1819. The water was drained by a water-wheel 6 ft. wide, and about 16 ft. diameter. He was manager of Stray Park, Great Wheal Town, and Godolphin Mine. Capt. J. Lyle took Godolphin afterwards. This mine was never worth a penny after the Messrs. Williams left it in or about the year 1809. At the present time, Capt. W. Teague, of Treliiske, the successful miner, has Tincroft, Carn Brea, Wheal Kitty, West Dolcoath, Unity Wood, and Great Work. Capt. Josiah Thomas, another successful man, has Dolcoath, Cook's Kitchen, West Frances, South Crofty, and New Cook's Kitchen. And Capt. Joseph Prisk, of Wheal Lovell, has Phoenix United, Tresavean, Wheal Worthy, New Great Wheal Vor, Great East Vor, and North Metal. All good men for their posts.—Truro, Jan. 24.

R. SYMONS.

#### HUMANUM EST ERRARE.

SIR.—To no persons is this proverb more applicable than to those who invest their money in mining enterprise, for there can be but little question that there are more errors committed here than in almost anything else; or, if there are not a greater variety of them, there are more repetitions of the same errors. The reason for this, in many instances, may be easily accounted for. There is a possibility of taking too sanguine a view of the matter, overlooking thereby the casualties to which all mining enterprise is liable; and hence, when the anticipated results are not forthcoming at the expected time, the disappointment becomes intolerable, often resulting in an abandonment of the concern, when some one else steps in and gets all the benefit of the errors committed by his predecessor, sometimes reaping a splendid fortune. Whereas, if the matter were calmly considered in all its aspects and bearings, such a rash step would not have been taken, and the loss and mortification been avoided. These thoughts have been suggested by what Messrs. Watson Brothers said in last week's Journal in reference to Gwydyr Amalgamated, which is just now "travailing in birth," having been brought on chiefly by the great depression of the metal markets. At Aberlyn there is a tremendous course of blende laid open, the blende from which has fetched as much as 3*l.* 17*s.* per ton, with speleite about 18*l.* or 19*l.* per ton, which, had the price continued, would have made a splendid profit, to say nothing of the splendid prospects that there are for lead.

It is true that this district has not yet obtained the reputation that many others have, simply for the reason that it has not been developed to the same extent as those were when their reputation was gained. Take, for example, the Van district; no one believed that there was any such mine to be found there as the Van until they had gone deep enough to prove the fallacy of such notions. The same thing applies to the mines in Pwllheli or Assheton district till the late Capt. Jeffery, by his indomitable perseverance, sunk deeper than anyone else had done and discovered the magnificent course of lead at Tan-y-Bwlch. To return: No one who is acquainted with this district, and the great number of mineral veins possessed by it, can but have the greatest confidence that there lay hidden, for some who will be persevering enough, an amount of wealth equal to that discovered in the above-named mines. But the question naturally arises, where is it to be found? or how are we to be guided in the search thereof? My reply is, the safest guide we have is to follow the closest analogy that is to be found; for, if certain results were obtained under some perceived conditions in those and other mines, the pre-

sumption is that here the laws of Nature, which know no change will bring about the same result. Here, then, we see the first step, clearly enough, which is a matter of selection, and in this the Gwydyr Company are second to none. They have the greatest lode of any running through the entire properties, from the south end of Aberlyn to the north, or extreme end of Clementina, just as nearly resembling at shallow depth the Van lode as two pins are alike, and possessing potentialities equally great, and the richest part yet undiscovered in this lode is at the deepest point that it has been wrought on, which is the bottom of No. 6 at D'Eresby Mountain. It is well known by those acquainted with the history of the Van Mine that it was by a fluke, so to speak, that the proprietors did not let it slip through their hands entirely only a day or two before the discovery was made, which is certainly an important lesson.

Then there are the advantages of water-power for all mechanical purposes, and splendid machinery, put up at a great cost at both mines, by which no delay would take place in getting the ore ready for the market the moment it is brought to surface. Underground there are thousands of pounds worth of useful work done, and every thing is on a fair way to success, which might be any day achieved, and it will be a pity if the shareholders fall into the error of giving up at the present time. I may add that I have been 32 years engaged in mining, and during that time I have always kept a close observation of the phenomena of lodes, and I must say that prospectively I do not know where to find a better property or properties than those possessed by Gwydyr. JOHN ROBERTS, M.E., M.M.S.

Truro, Jan. 24.

#### THE LATE CAPT. JOSEPH VIVIAN.

SIR.—Several of the most prominent mine managers in Cornwall have had under their control numerous mines, many of them co-temporary. For instance the late Capt. J. Vivian, of Camborne, managed the following:—North Roskear; Wheal Susan; South Roskear; Providence Mines, Lelant; Wheal Rose, Sithney; Wheal Tryphena, Camborne; West Stray Park, Camborne; Cook's Kitchen, Illogan; South Condurrow, Camborne; North Wheal Crofty, Illogan; East Wheal Seton, Illogan; Sidney Godolphin, Breage; Leed and St. Aubyn, Germoe; East Alfred Consols, Gwinear; West Wheal Kitty, St. Agnes; North Downs and Wheal Rose, Redruth and St. Agnes; North Buller, Redruth; New Dolcoath, Camborne; North Dolcoath, Camborne; Wheal Annie, Gwinear; Wheal Unity, Gwinear; Wheal Nelson, Camborne; West Godolphin, Breage. R. SYMONS.

Truro, Jan. 24.

#### THE TREVITHICK TESTIMONIAL.

SIR.—"Honour to whom honour is due"; "Better late than never." I find that it is in contemplation to do something to immortalise, if possible, the inventive genius of the late Richard Trevithick, of Camborne, who, jointly with the late Capt. Andrew Vivian, of the same town, originated the locomotive steam-engine. The object of my writing this letter is to claim for Capt. A. Vivian his title to be equally remembered, because he is as much entitled to the honour as Trevithick. The testimonial, whatever form it may take, should be to Trevithick and Vivian.

At a late meeting, held in Truro, the attention of those present was called to the fact that Capt. A. Vivian was so entitled, but his name was very improperly ignored. I have now before me letters and facts which prove that Capt. A. Vivian was as much the inventor as Trevithick of the locomotive which was made by them in Camborne, and worked on the roads there, and the patent was taken out in their joint names. Capt. Vivian, in 1834, finding that Mr. Goldsworthy Gurney, who invented the "steam jet," was likely to receive something from Government in respect of the locomotive, in July of that year wrote the following letter to Sir R. R. Vyvyan and Mr. Pendarves respectively, the then Members for the Western Division of Cornwall:—

SIR.—Having observed in the West Briton of yesterday that yourself, with several other honourable Members of Parliament for this county have obtained consent for a Committee to be appointed to provide a compensation to Mr. Goldsworthy Gurney for his being the first person who invented a locomotive to travel on common roads, I take the liberty to observe that I was the first who ever invented anything of the kind, in conjunction with Richard Trevithick, for which we obtained a patent at the time that it was on the road in London. It ran well, however, there were some defects, and our finances being low we were compelled to abandon it. If Mr. Gurney, who knows me well, will consent to my participating with him in equal shares in any amount that Government may deem fit to remunerate him with, I will not interfere; if not, I must take the liberty of petitioning Parliament on the matter, and humbly beg the favour of your supporting it. Mr. Gurney has acknowledged in a letter he published, my invention. I should feel very grateful for your, and your friend's advice in this affair; what steps I had better take, as you well know that cash is not too plenty with me. Your early answer will oblige. ANDREW VIVIAN.

I do not know the sequel. The following is the copy of a letter written by Mr. Henry Andrew Vivian, the son of the inventor:—

SIR.—According to promise I send you some account of the first steam-carriage that was ever made. It ran on the common roads. My father was a man of great inventive and arithmetical powers of mind. He has often made up the duty of an engine while we have been walking the road together; multiplying six figures by four figures, and giving the right answer without pen or pencil, by retaining the figures in memory. Mr. Trevithick was a man also of inventive powers of mind, but would too often run wild for want of calculation. They did well together but badly separately. They built the engine in a little shop at the bottom of this town, which took them a long time in building as they did most of the work themselves. I find the first entry made in my father's book which he kept for the purpose, and which is now before me, is May, 1801. They obtained the patent for the engine in January, 1802. The entry is thus stated:—1802, January and February—Expenses to London, and cash advanced to Mr. Trevithick procuring patent, 100*l.* 11*s.* They carried their engine to London about the middle of 1803. Another item is thus stated:—Sept. 14—Paid Mr. Felton, coachmaker, 83*l.* 5*s.*; so the carriage for the engine was built in London. The parts of the engine were sent from this place, and put together in town, and my father superintended its erection, and it ran from the place of its erection to Paddington and back again several times. I well recollect its going up and down in our town several times, and the rise in one part of the town for 300 ft. in length, is 1 ft. in 20. The women used to call it "the Devil." Not making it answer they sold it to a company in Merthyr Tydfil, in Wales, where it ran on a tramroad, and was seen there by a friend of mine about two years since. I send you a copy of a letter which my father wrote in 1834 respecting it. [The above letter.] Mr. Gurney never saw the engine which was built here, for it was destroyed by fire before he came to Camborne with me, as stated in my father's letter. When you have made what use of the enclosed you think proper please return it to me. I have given you in a few words as I can an outline of the whole, and I hope it will suit your purpose. My father lost by it above 120*l.* as most of the expense fell on him. Expenses incurred in erecting a steam-carriage by Trevithick and Vivian from May 1801 to end of March 1804:—

Erection at Camborne, and obtaining a patent

northern lode when intersected will have about 300 fms. on its course each side of the tunnel.

N.B.—I have not wrote this to contradict anything Mr. Dowling has stated, but simply to show the thing on its own merits.

J. BUCKINGHAM.

#### THE CARADON DISTRICT.

SIR,—Notwithstanding the increased energy which has been manifested of late in mining operations throughout the Caradon district there is still ample room for a further infusion of new and vigorous blood to develop the vast metallic resources of this locality. Many lodes situated in congenial strata for abundance of mineral, and are spoken favourably by mining experts, exist and are at present comparatively intact. The past history of mining pursuits in this neighbourhood has been remunerative and successful, and what has been done in this district will evidently be done again. It is an acknowledged fact by men who are in a position and capable to judge that no speculative industry pays like productive mining, particularly when there is sufficient capital subscribed at the commencement of the enterprise to carry out the necessary preliminary and exploring work, and especially when the true principles of discretion, economy, system, and perseverance are truly observed and legitimately performed. System is the principal framework of economy. I am reminded since reading of the auspicious condition of South Caradon Mine of a geologist, who when speaking of the productive mines and in giving a geological description of the district said that what the district had done it would do again, and more South Caradons and more Phoenixes, besides those at work, would be discovered and found to be equally productive and remunerative, and would be prosecuted by successors to subterranean depths which some may deem fabulous—a prognostication which in all moral probability will be borne out. Such, then, are some of the signs of the times. It is indeed gratifying to learn that the Caradon mines are fast coming to the front, and are assuming their former prolific and profitable position, and some are again being placed on the Dividend-List.

The encouraging and promising aspect of the various mines has had an exhilarating effect on all who take an interest in mining pursuits, and in the welfare of mining in general. The dividends recently declared in the Phoenix United and South Caradon will undoubtedly prove a good stimulus to shareholders in new concerns, and will obviously tend to induce them to work their mines vigorously, so as to let the mining community at large know that there is inestimable quantities of mineral in the Caradon district awaiting the judicious appropriation of capital to develop the lodes and bring the mineral to surface. Five lodes which present kindly appearances have been discovered at New South Caradon Mine; a trial shaft has been sunk near 10 fathoms where the lode is 3 ft. wide, composed of gossan, quartz, mudi, and stains of copper ore; this sett is contiguous to South Caradon, and there is no reason to disbelieve that this may be one of the new South Caradons spoken of by the geologist mentioned. The promising character of this new enterprise has doubtless brought to memory the starting of South Caradon, which, according to records, yielded in the year 1838, one year after its commencement, 138 tons of ore, worth 1198*l.* Ten years afterwards 2748 tons were disposed of for 16,388*l.*, and in twice ten years more the little speck of ore first turned up to candle light by the miner's pick had developed into an annual sale of 6481 tons, realising 49,107*l.*, such is the demonstrative evidence of wealth under the soil in this locality. Without venturing to solicit any more space to continue the enumeration of other successes—suffice it to say, that what the district has done it will do again, believing in the maxim, which the common sense and experience of the Cornish miners has always rendered extremely popular—"Sink and drive." Our progressive mines are glowing forth with a promise which further induces us to endorse the sentiments of the geologist, and the past should be sufficient to render stronger the faith of rational believers in the vast wealth of the mineral resources of this neighbourhood, and should be sufficient to dissipate the prejudices of those sceptics who, incapable of crediting anything good which they have not seen, and who reject research below the world's upper crust, as they think the hidden riches chimerical, and leave the buried talents to unprofitable repose.

S. J. VINCENT.

Cheesewring, Jan. 20.

#### COLLACOMBE MINE.

SIR,—This mine, which was to exhibit a new feature in mining, and was to enable the working man to participate in the profits, was some year or two ago started under most glowing auspices, and was to lead to great results. The mine, which had been worked before, was stopped, it was said, not on account of its poverty but owing to the bursting of a boiler of the steam-engine. Great riches already discovered remained underground, and to give the public a chance of joining the scheme was launched in a million shares at 1*s.* per share. After working some time, the mine is again knocked, and the machinery is sold, and of course bought by some one or other. In most mines, including East Wheal Rose, and others of equal celebrity, accounts are published, enabling the shareholders and the public to judge how the money has been expended, how much has gone to the promoters and others, how much has been spent in the actual trial of the mine, and other interesting and instructive particulars; and for the sake of the poor men who took shares in Collacombe Down Mine, a similar statement will, it is to be hoped, be published.—Jan. 23.

ONSEWER.

#### EAST CHIVERTON.

SIR.—The north and south lodes recently met with in driving the 100 fm. level west, and modestly reported by the agent last week as worth  $\frac{1}{2}$  ton per fathom, although, judging from the rock of ore shown to me by the Secretary, and which Mr. Granville Sharp told me had just been sent him from the newly-discovered lode, I should say the lode would produce nearer 2 tons per fathom. A better specimen of a rich lode no one can desire to see, and there can be no doubt but the lode will be found in all of the levels over the 100, as the finding of this lode at the 100 will account for the disturbance of the east and west lode in each of the levels in driving west. I hope, and it is not too much to anticipate, that this north and south lode will prove as great a prize for the plucky shareholders in East Chiverton, as a like discovery did for the old East Wheal Rose shareholders some 50 years ago when on the point of winding up, which discovery (also a north and south lode) produced, in from 11 to 12 years, 287,000*l.*—a proverbially known fact.

AN OLD MINER.

#### MINING ON HALKYNS MOUNTAIN, FLINTSHIRE.

##### THE EAST LONG RAKE LEAD MINE.

SIR.—Since my last letter on this subject appeared in the Journal I find a change has taken place in the directorate, and the offices of the company have been removed from London to Liverpool; at the same time new blood has been infused into the concern, and arrangements are being made whereby the property is to be developed more energetically. The new directors, I am informed, are influential gentlemen, and it is to be hoped that they have brought in with them sufficient capital to carry out the work which for a long time past has been recommended by the local manager and other mining engineers. This being the case there need be no cause for anxiety as to the future, success being assured already. Within a short time a run of ore ground, 40 fms. in length, has been driven through, and 800*l.* worth of rich lead ore has been sold from the workings on the 80 fm. level on the middle lode, and had it not been for the low price of lead this should have realised at least 1300*l.*, and the difference would nearly have met all expenses. In the main shaft a skip-road is being fixed which will facilitate the working considerably, and I am informed that deeper levels are to be commenced forthwith—at the 60—and it is my opinion, and that of every practical miner who knows the property, that immense quantities of lead will be raised from the various lodes at that level; indeed it seems a great pity that the work of intersecting and driving on the lodes at the 60 should have been delayed so long, but doubtless good reasons can be assigned for this—probably a want of sufficient capital to work other portions of the mine and this simultaneously. The mine

is amply provided with machinery, which is well and substantially erected. In writing of this property I might say that my experience in this district has been a long one, extending over many years; during that time I have inspected, reported on, and managed some of its leading mines; my opinion, therefore, I would submit, is entitled to something more than passing consideration, as I know the locality thoroughly. If this company will only continue to pursue a systematic development of the different lodes at the 50 and 60 fm. levels they are certain to have a rich mine, and although lead mines of late have been under a cloud, and investors seem to have overlooked them, yet here is an opportunity for gentlemen who have spare capital to invest, to obtain a good return for their money, even at the present low price for lead, and when an advance takes place (which is inevitable) profits will of course increase in the same ratio.

Jan. 23.

TOURIST.

#### FAVOURABLE LIMESTONE.

SIR.—For some time past the above words have been a very prominent feature in the Richmond weekly reports, and have excited a considerable amount of curiosity among those interested in the mine as to what their full significance may be. I would have written to the *Mining Journal* before now asking if you could throw any light on the matter, but I thought that I might thereby be displaying more of that ignorance of mining affairs, and of the Richmond in particular, of which I was accused on a former occasion. It appears, however, from the San Francisco Daily Exchange of Dec. 27, that our Californian friends are equally ignorant of the significance of the words in question, and I am therefore emboldened through the medium of your columns to endeavour to obtain, for my own satisfaction and that of the readers of the Daily Exchange, an explanation of the words "Favourable Limestone" as bearing upon the prosperity and prospects of the Richmond Mine. You will notice from the article in question that limestone is very plentiful in the Ruby Hill district—but "Favourable Limestone." What is it?

Glasgow, Jan. 22.

R. D.

#### EAST DEVON CONSOLS.

SIR.—Hearing something good concerning the above mine this week I looked around to see what is being done, and was pleased to find the miners working in right good earnest, sinking an engine-shaft, and judging from the splendid-looking stuff coming up I am led to believe they are not far from cutting a rich course of ore. At the mouth of the adit I saw a large pile of rich-looking stuff; such quality ore is not often seen at so shallow a depth. Some of the richest copper was taken from a winze sunk below the adit. I have been a miner nearly 40 years, and have been through and inspected many mines in Devon and Cornwall, but never saw a sett which holds out more certain prospects of becoming so great a prize as this mine. This property adjoins Brookwood and Wheal Emma, now called South Devon United, which have been worked many years, and paid nearly 50,000*l.* in dividends. They are not one quarter worked out, although 250,000*l.* worth of ore has been raised and sold. East Devon Company will cut Brookwood lode by sinking the present shaft, where they can command the side lodes, one of which will form a junction by the time they reach the 40 fm. level.

OLD MINER.

Buckfastleigh, Jan. 16.

#### SOUTH DEVON COPPER MINES.

SIR.—In referring to the South Devon United Copper Mines and Pickstone's shaft as 155 fathoms deep it should be understood that this is upon the underlie of the lode, and only gives 120 fathoms perpendicular depth from surface, or 100 fathoms below adit. It is singular that three or four of the finest copper mines in the West of Cornwall, after giving large and profitable returns to a depth of about 100 fathoms, at which point the lodes fell off in productivity, and for 30 fathoms in depth the lodes were poor and not worth working; during which period many of the largest shareholders relinquished their shares. With difficulty the remaining shareholders succeeded in sinking through the unproductive ground, and came upon a new course of ore in another productive channel, when the old shareholders bought back much of their former interest, and in some cases shares were purchased at 4*s.* per share. From the time of this discovery the mines paid regular dividends for many years and shares reached a price, in one or two of those mines, of 1200*l.* per share; and even at that price there were very few to be obtained. I attended some of these dividend meetings for a relative who was a shareholder, and am well acquainted with some of the chief causes which produced these large results, which I will refer to on some other occasion.

In the case of these South Devon Mines, which are to be the crowning mines of the future, most of the unproductive work has been done, and the sacrifices that have been made by shareholders, who sold at a nominal price during the depression while this work has been going on, have been considerable; but the opportunity now offers, as the levels are entering the newly discovered courses of ore, east and west, whereby they can obtain shares at the present low price, with the prospect of a quick and certain advance. The 110 fathom level is reported close to the point east to come under the rich course of ore gone down at the 100, the cutting of which put the shares, on that occasion, at a premium of 500 per cent.; and the new shoot of ore at Pickstone's is being opened upon in the direction of the old sump shaft, where the leader of rich ore of this new shoot, below the unproductive bar, was first discovered; so that either of these points may any day make a difference in value of many pounds per share. When also the present depth of the mines is only 100 fathoms below adit, with the prospect of riches, holding down through favourable strata known to be dipping beneath the present deepest point of the mines, of 200 to 300 fathoms in thickness, the chances of entering upon great success are much in favour of those who may embrace the advantages offered by the present opportunity of purchasing shares at a low price.

CHRISTOPHER ROBINS.

London, Jan. 17.

THE VOLHARD SILVER ASSAY.—The method having been recommended to Mr. Herbert G. Torrey, of the U. S. Assay Office, New York, he has had it tested by one of his most careful assistants in the silver room—Mr. Geo. B. Comings—under his own personal observation. The experiments conclusively show the rhodan-ammonia process is decidedly inferior to the present chloride method. The process depends upon the strong affinity between thiocyanic acid and silver, and the intense colour formed by its combination with iron. Sulphocyanate of ammonia is added to the silver solution in presence of a ferric salt, and when all the silver present is satisfied, the thiocyanic acid combines with the iron, producing a colour which varies from light brown to deep red, according to the quantity of sulphocyanate added. In the first tests, the solution of rhodan-ammonia was made of such a strength that 100 c. c. precipitated a little less than 1000 milligrams of silver. From a solution of one-tenth strength, small amounts were added until a permanent colour appeared. In this way, several sets of 10 or 12 assays each were worked, and the results compared with those obtained by our usual salt method. To secure more rapid and satisfactory returns, the solution was changed so that 100 c. c. completely precipitated 1000 milligrams of silver, and left a slight excess of the precipitant, producing a red colour of intensity varying in proportion to the excess of the sulphocyanate, and the assay was then worked to the point of neutralisation by the addition of a decimal solution of silver, until the colour disappeared. On comparing with chloride assays, this was found to give somewhat better returns than the first method, in some instances agreeing closely with the correct fineness, but in others differing too largely to be at all satisfactory. Comparison with the chloride method was then abandoned, and sets of proof silver were weighed with scrupulous exactness, and special attention paid to the boiling of the assays, to expel all the lower oxides of nitrogen formed during the solution of the silver. To determine both the delicacy and accuracy of the process, these were worked after the first charge with a solution diluted so that 10 c. c. contained one milligram of silver, and a correspondingly dilute solution of rhodan-ammonia. This was continued until the repeated discrepancies between the results showed that the process, as applied in these experiments, was not reliable

closer than one half thousandth. Assays of proof silver made by the salt method will indicate differences of one quarter thousandth with great distinctness and reliability, and in our regular work we frequently note differences of less than one quarter thousandth, which we call tenths, so that even on fine metal the process failed to show any superiority over the salt. When 10 per cent. or more of copper is present in the bullion, the colour of the solution interferes with the noting of the appearance or disappearance of the iron reaction, while in the salt method copper is not an impediment.

#### REPORT FROM CORNWALL.

Jan. 25.—Probably the severest test that could be applied to any one's ingenuity just now would be to write anything novel or striking about mining matters in the West that would be worth the reading. Dulness still reigns supreme with the exception of a very few of the leading mines, in which there is a fair amount of activity. Beyond that limit a judicious investor ought to be in no difficulty in putting out his money to advantage. A turn, if not precisely the turn, cannot be far distant, and then the chance may be missed. So far as we can gather, the mines, as a whole, are looking well, and if there is wanting any element of excitement, it is equally certain that there is also an absence of anything that should tend to further depression. It cannot be, with the present satisfactory outlook as to the trade in general, that mining can remain much longer without adequate participation in the general prosperity. As is customary when there is a lack of more satisfactory topics for discussion, the "Red River" has once more been brought to the front, and the merits and demerits of the system of mining which make possible the profitable working of the streamers thereon is being again discussed. Apparently there is no prospect of a more adequate solution of the problems involved than hitherto; but a suggestion has been made, which if practicable might help in some degree to meet what is on all hands regarded as a hardship—the fact that so much of the profits of the tin raised by the adventurers in the mines goes into the pockets of the "Red River" men. The suggestion is that the mines which supply the stream should combine to work it for themselves. Let what care may be taken on the dressing-floors, we are convinced that much tin will go into the river. It does seem, therefore, to be a common sense suggestion that the mines, if possible, should follow it up to the end.

Slate quarrying is not in the most flourishing condition just as presented in the county, though a large quantity of material is still being raised. Bowthick, in Lanteglos and Tintagel, is knocked, and the whole of the machinery and materials are to be sold. There is no finer slate than the Cornish slate, as the long enduring fame of Delabole bears witness; but somehow only a few of the ventures seem to flourish. Perhaps there will be a material change for the better when the district is properly opened up by rail.

Very handsome offer has been made by Mr. Basset, of Tehidy, which, it is to be hoped, means ere long to be found to accept. He proposes to increase his subscription to the Miners' Hospital from 30*l.* a year to 180*l.* if the accommodation is increased. It is understood that the committee do not see their way as yet to do this; but surely such a munificent proposal should be met if possible, and the most strenuous efforts should not be spared.

We referred casually last week to the manner in which, by the action of the Government authorities, a stop had been put to the manufacture of blasting gelatine. It is Colonel Majendie and Dr. Dupre against the world. In his test trial, the latter reduced the temperature of the gelatine to 14° Fah., and then raised it to 80° Fah., three times in succession, keeping it for 24 hours at each temperature. The whole contention of the Home Office was, that after subjecting it to this extraordinary test the gelatine was softer than it should have been. On the other hand, Dr. Dewan, Professor of Chemistry at Cambridge, Vice-President of the Chemical Society, and Professor of Chemistry at the Royal Institution, London, and Mr. Tatlock, Chemist to the City of Glasgow, have stated that in their opinion the softness of the gelatine within certain limits—which have not been exceeded—so far from being an element of danger is in fact a point of safety. What the manufacturers urge is that the test is unnecessarily severe, since the gelatine was not subjected to temperatures of 14° and 80°, but was reduced and raised to those temperatures itself, which means a greater range of temperature, the gelatine being a very bad conductor of heat. It is impossible to make gelatine of such a consistency as not to get softer under such changes of temperature applied in so short a time, and since these changes are really immaterial, it is hard to understand why the Government Inspector, Colonel Majendie, persists in his view, or why, at any rate, he refuses to accede to the appointment of a small commission to enquire into the full facts of a matter in which the balance of evidence is against him. It is, of course, essential, that in the interests of the public, safety explosives should be tested, and that thoroughly; but in this case there really does not seem to have been no test at all—at any rate, none that scientific men would accept as adequate without further enquiry, and this is refused. The consequence is, that an important industry is quite suspended, on the result of merely individual action. That the blasting gelatine met a want is proved by the fact that the demand was greatly in excess of the supply, and it does seem monstrous that any single man should have thus the power to stop a manufacture and to put miners and quarry-owners, &c., to serious inconvenience and additional expense, and that without the right of appeal, even when his views are challenged by the highest scientific opinion.

#### REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Jan. 25.—New business was difficult to secure on 'Change in Birmingham to-day, as well in finished as in crude iron. Middlemen and consumers alike appear to be still possessed by the notion that they shall be able shortly to buy on better terms. They declined, therefore, to give makers' prices for any commodity for which there is not pressing need. In both departments, however, makers and vendors hold their ground with tolerable steadiness. Indeed, pig transactions are known in which for a considerable quantity the users of some good qualities of hematite pigs have had to give pretty much makers' full terms. In the finished iron department the major enquiries affect sheets, yet the galvanisers, who are the chief consumers, are placing scarcely any orders. They decline to give 8*s.* 15*ps.* for doubles, and they will not purchase singles at 8*s.*. There was no longer the expectation expressed by proprietors of mills and forges that early business will be coming from the United States as the result of the current tariff legislation: 8*s.* was rarely obtained for marked bars—in truth, 7*s.* 10*ps.* was not easy to get; a good medium bar was procurable at from 7*s.* down to 6*s.* 10*ps.*, and more common bars than last week were to be had at 6*s.* Native pig ranged from 2*s.* up to 3*s.* 10*ps.*, according to quality. Coal was firm, but not active. Cannock Chase steam coal was to be had at from 6*s.* 6*d.* to 7*s.* and slack for engine purposes at from 3*s.* to 5*s.* The best deep house coal was again as high as 10*s.*; shallow, 9*s.*; seconds, 8*s.*; and common, 7*s.*

Mr. John Bradley, coalmaster, but now out of business, of Shaver's End, Dudley, filed his petition in the Dudley County Court, on Wednesday. The liabilities are estimated at 6000*l.*, but the assets are not yet ascertained. The adjudged inquest was held on Wednesday at Chase Town on the three miners who were killed by falling down the shaft through the breaking of the wire rope at one of the pits of the Cannock Chase Colliery Company two days before Christmas. The Government Mines' Inspector for North, Mr. Winn, and the Assistant Inspector for South, Staffordshire, Mr. W. B. Scott, in their evidence stated that the rope was a very good one, and the arrangements would have satisfied them if their opinion had been asked before the accident. The accident was, they believed, caused by the high wind having acted on a slack portion of the rope beyond the pulley, throwing it out of position, and causing it to climb the flange of the pulley, whence it slipped on to the axle, and that the rope got cut as it passed through the ring of the disengaging plate. The verdict returned was to the effect that the deceased were killed by the breaking of the rope, and that the breakage was caused by the rope

climbing the pulley, but that there was nothing to show what was the cause of the rope climbing the pulley.

At a conference of miners' delegates which has been held at Burslem, in North Staffordshire, it was resolved to co-operate with the Lancashire and Yorkshire miners in doing all that was possible to restrict the output of coal.

#### TRADE IN SOUTH WALES.

*Jan. 25.*—The pressure of business at the principal South Wales ports continues, more especially at Cardiff, where dock accommodation is not adequate to the demands of a constantly expanding trade. At least 30,000 more tons of coal could be shipped there every week with the present facilities if proper arrangements were made. The shipments were:—Cardiff, 133,718 tons foreign and 16,151 coastwise; Newport, 39,135 tons foreign and 17,691 coastwise; Swansea, 21,736 tons foreign and 8267 coastwise. Prices are firm, and for immediate shipment enhanced prices are asked. Good colliery screened is quoted at 11s., while inferior sorts are quoted as low as 9s. 3d. The news from Cyfarthfa is to the effect that 18 puddling furnaces are now at work, and in a short time the whole of the works will be in full swing in the make of steel. Iron has been sent away from Cardiff to the extent of 2564 tons, and 8634 from Newport. Of iron ore there has been received at Cardiff from Bilbao 5148 tons, and 8013 from other places; Newport, 3500 tons of ore from Bilbao; Swansea, 2979 tons. The price is from 15s. 3d. to 15s. 6d.

Mr. G. H. Davey, manager of the Briton Ferry Ironworks, and who has been connected with those works for the last 29 years, has received instructions from the trustees in liquidation of Townsend, Wood, and Co. to stop the whole of the above works as soon as possible. The puddling was stopped on Saturday last. The manager and clerks received notice to leave in a fortnight. Through this stoppage upwards of 1000 hands will be thrown out of employ. This, taken in consideration with the stoppage of the Vernon Tin-plate Works, which occurred five weeks ago, has cast a sad gloom over the whole of the neighbourhood, as the population, which is about 6000, depend entirely upon those two works.

The tin-plate trade is reviving in consequence of the lessened output. Good coke-mades realise 17s. per box, and charcoal-mades from 21s. to 22s. Block tin is in weak demand at 93s. per ton.

Lord Bute will cut the first sod for the new Roath Dock on Jan. 31. The extension of the Penarth Dock (which is part of the Cardiff system) is being carried forward with energy, and the Barry Dock scheme has passed the Examiner of Standing Orders in the House of Commons. Sir George Elliot, M.P., and friends have bought the whole of the shares from the Newport Old Dock Company. On the other hand, the Milford Dock scheme, which was to rival Liverpool, has come to grief. Among the new schemes which will benefit Cardiff is a railway from Risca, which will throw open the extensive coal fields of Monmouthshire to the port, and compensate the town for the loss of trade which will be diverted to Barry.

The new manager of the Rhondda Junction Colliery, Pontypridd (Mr. W. Thomas) has come upon a splendid vein of coal, known as the 6 ft. steam coal. This is said to be the third company which has tried to obtain success at the pit, which is a new one, but previous efforts have proved fruitless. During the latter end of last week the former gloomy state of things presented a more glittering aspect, thanks to the energetic exertions of the new manager, and on Saturday Mr. Taylor, one of the chief shareholders, as well as Mr. Kirkhouse, chief engineer of the company, visited the colliery, and on learning these good tidings, directed the officials and the men to meet that evening at the Colliers' Delight Inn, where a liberal repast was provided for them at the expense of Mr. Taylor, in honour of the event. Addresses were delivered by the manager (Mr. W. Thomas) and the cashier (Mr. Benjamin), and the latter referred to the liberality of the company, remarking that it was the kind of feeling which ought to exist between employer and employed, and expressed a hope that it would never cease in connection with the company. A large number of new hands will be taken on at once at this colliery, owing to the discovery.

#### REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

*Jan. 24.*—Before we resume our journey around the coast of Wales, let us turn inland and note the mineral resources of a Welsh valley—the last to be supplied with railway facilities. This is the Tanat Valley, for the construction of a railway up which a bill was obtained in the last session of Parliament. The River Tanat joins that of the Vyrnwy—a branch of the Severn—between the villages of Llanymynech and Llansaintfraid, Montgomeryshire. From this point to the termination of its two chief branches—Pennant and RhiwARTH in the gorges of the Berwyn Mountains—is a distance of 25 miles. The new railway—the Oswestry and Llangynog—enters the valley a little way from its mouth at Porthyswaen. It commences by a junction with the Cambrian Railways, in the midst of the extensive range of limestone quarries of Porthyswaen, which extend for nearly three miles from Llancly to the Moel-ydd. These quarries, besides the great trade they have with the outside agricultural and ironworks' world, have a large trade all the way up the Tanat and its tributary valleys. For a distance of 12 miles or so we do not pass by any mines or quarries, but the route lies through a charming valley, opening out in places into small plains. Its rocky sides and the bold promontories that abut against it are well wooded, with well-to-do farms nestling in the hollows and studding the plain, for the land is among the richest in Wales. We pass the village of Llanyblodwel, with its picturesque church and tower, then the village of Penybont—the lower. Next we come to the delightful hamlet of Llangedwyn, with its green and its pretty church, and the hall—one of the ancient residences of the Wynne family—with its unique avenue of limes.

A few miles further on we catch a sight of the noted waterfall—Pistill Rhaeadr—shining like a long silver band down the dark rocks of the Berwyns, and so we come to the mouth of the tributary valley, the Iwrch, and here our mining work proper begins. About two miles up this valley is the lead mine Blaen-y-Glyn, and five miles further up is the Maengwynedd Slate Quarry—a quarry well opened out and ready for a good trade if it only had access to the market. A tramway has been surveyed to connect this quarry with the main line. There is room for a dozen slate quarries here, and interstratified with the slates are greenstone rocks, like that successfully worked in the adjoining valley of the Ceriog, well adapted for paving sets. A little way above the junction of the Iwrch with the Tanat we reach the important Welsh village of Llanrhaidr-yr-Mochnant, and we traverse the valley of the Rhaeadr five miles up to the waterfall, which is a great resort during the summer months. On our way we pass on our left the Nant-y-Blaidd Lead Mine; then we come to one which has been of great historic importance—the Craig-y-Mwyn, or as it has been recently known, the East Llangynog. Close by there is the Craig Pistyll Slate Quarry, from which a good many slates have been sold, but which wants further development. There is also the commencement of another on the Cwm-farn; indeed, there is no lack of slates from here to the summit of the Berwyns.

We retrace our steps to the main valley, and a couple of miles higher up we turn to the left to notice the phosphate of lime deposits of Penygarnedd and Cwmgwnen. A bed of phosphate of lime from 10 to 18 in. thick runs south-west from this point for six or seven miles. Two mines are opened upon it, and the quality can be sustained to at least that of the Cambridge and Suffolk coprolites; but the industry languishes, as all the mining and quarrying industries of the valley languish, for the want of reasonable carriage. Between the two mines last named is the lead mine of Bwlch Creolas, which has recently been fitted up with extensive dressing machinery. Again we retrace our steps, and a mile and a half higher up the valley we reach the populous village of Penybontfawr. We turn aside to the left up the Hirnant Valley, in which there are the Craiggdu Lead Mine, the Clochnant Lead Mine, and the Clochnant Slate and Slab Quarry. At the head of the valley we come upon the entrance of the tunnel, which passing between two and three miles under the mountain, will communicate with the great Lake Vyrnwy now being formed by the Corporation of Liverpool. If we could look through the mountain we should see the most unique

and extensive stone quarry in Wales, where great blocks of solid stone are being obtained for the great embankment of the lake. A branch line has been surveyed connecting these important works with the Llangynog Railway at Penybont. If this line were made it would be difficult to over-estimate the advantages that would accrue to the corporation, to the works, and to the neighbourhood. Three miles above Penybontfawr we arrive at the mining and quarrying village of Llangynog and at one of the most hospitable village inns in Wales—the New Inn, with its date 1751 inscribed on its walls. Let me enumerate the works around us. On the other side of the valley is the Old Quarry, or Rhiwarth Slate and Slab Quarry, with its works extending nearly to the top of the mountain. Inclines, galleries, tunnels, and slate sheds meeting the eye in every direction. This is one of the oldest quarries in Wales, and its returns have been and may be now very large, but long land carriage

reached a turning point, and better times appear to be in store for this important business. The demand for the principal chemical products is at present very strong, and a considerable advance has been secured in the price of many of them. All the great shipbuilding yards have orders on hand which will keep them employed for 12 months, and there are still enquiries for new ships, especially for vessels of moderate size—from 1000 to 1400 tons burthen. Several new ship-yards are to be opened on the Tyne. Mr. John McIntyre, formerly manager of Palmer's Works at Jarrow, will commence building vessels immediately on the south side of the Tyne, near Hebburn. Mr. Edwards, of South Shields, has commenced new works on the north side of the Tyne, and many other new works are projected at Walker and other places. The works of the Armstrong-Mitchell Company at Elswick are expected to be on a large scale.

The iron trade has been very quiet this week. The lack of animation in this trade at present is difficult to account for. It is ascribed to various causes, but it is not likely to be of long duration. Shipments have been small this month. However, stocks are not large and makers continue firm in their quotations. There is little chance for the "bears" at present. There is a good demand for manufactured iron. One of the plate mills which was stopped has again been put in operation, and the Bishop Auckland Works are also expected to be re-started shortly. There is no change in the prices of finished iron. The cast-steel trade is fairly active, and all the works are going. There is no change in the value of coke and coal for iron-making purposes. The coal and coke shipments at Tyne Dock during the past week are the largest on record—110,960 tons. The average shipments from one dock of 18,500 tons daily is one of the most remarkable features in the history of the coal trade, and it is one that is not paralleled in any other district. The exports of general goods from the dock has also been large, and the imports have also been heavy during the week.

**COKE MAKING AND THE NEW PROCESSES.**—The improved mode of making coke, by which the tar, ammonia, and other products are secured, attracts much attention. The patent process introduced by Mr. Jameson has been now tested for a considerable time at Mr. Patterson's Felling Chemical Works, and, so far as we can learn, with very remarkable success. The same system has also been introduced at Page Bank, Pease's West, and other places, and encouraging accounts are given of its success at Pease's West. Sir J. W. Pease states that they had arrived at some degree of success, and are now getting tar and ammoniacal liquor; and, what is very remarkable, he states that the coke made is of superior quality, and that a greater percentage of coke is got out of the new ovens than they could get out of the old ovens. So far, then, taking the coke manufacture simply, the introduction of the Jameson process appears to offer very substantial advantages, but it also appears to give the means of benefiting largely also the chemical manufacturers, which is a very important one in this district. Lately a paper was read before the Society of Chemical Industry at Burlington House, London, by Mr. William Weldon. This able writer states that there is hope that the period of depression through which this trade has passed is likely soon to terminate. These hopes are based upon the substantial ground of cheapening of production due to reduction in the price of pyrites, recovery of sulphur, and economy of coal. The main reliance of the author is in the Jameson coking process, by which, with extreme simplicity and economy, products of coal are extracted of such value as to leave the resulting coke as fuel for soda-making practically free of cost, and as the Leblanc process requires much more coal per ton of soda made than the ammonia process, the gain will tend, with other matter referred to, to put the two processes much more on a level than they are at present. Mr. Weldon, however, rightly remarks that, if this process be applicable to the soda manufactures, it is equally so to almost all other industries, while the result to the material well-being of mankind, in its general application, it is utterly beyond the power of any imagination adequately to conceive. This idea meant, among other things, cheaper fuel for all purposes, an enormously increased supply of agricultural produce, and the entire suppression of smoke, even in the busiest centres of industry. It is worthy of notice that when gas is of secondary importance and a large yield of ammonia and condensable products are required, a very gradual distillation with low heat is necessary, which is exactly that provided in the ordinary coke oven ignited from the top. In the chemical trade a very large quantity of raw coal is consumed at present, at the Tyne Chemical Works, the largest works of the kind in the world; about 1200 tons of raw coal are used per week, and if this coal can first be converted into coke and the valuable products pointed out secured in the process, the coke will then be got free of cost, and this coke is actually more suitable for the chemical processes than the raw coal. It would appear, therefore, that there is here a large field for profitable enterprise. In the early days of coke making in Durham good coke could only be produced over a very limited area of the coal field; the process was rude and primitive, the coal being put into the ovens as it came out of the pit in its rough state, and, of course, it contained many impurities inimical to the production of good coke. The first great improvement was the introduction of the washing process, the invention of the late Mr. Morison, who established works on the Wear many years ago; a large fortune was the result of his ingenuity and enterprise. Of late years crushing machinery has been used, by which the coal is reduced to fine powder, and it is then introduced at the top of the ovens. The area over which good coke can be produced has been largely extended by these means, and the Jameson process is likely to result in a much larger extension of this area. A great variety of coals have been tried at Felling ovens, and it has been found that even the small coal from the Northumberland steam coal field can be converted into fair coke under this process.

#### REPORT FROM DERBYSHIRE AND YORKSHIRE.

*Jan. 25.*—There has not been much change in the state of the trade in the mining districts of Derbyshire since last notice. The recent discovery at the Magpie still furnishes a fair amount of pabulum for gossip. The latest addition relates to what is termed the tragedy, which is said to have taken place some 40 years ago. There having been a dispute between the owners of the Magpie and an adjoining mine, in which it was alleged one had passed the boundary when the workings crossed each other. It is said that straw saturated with coal tar and impregnated with sulphur was placed at the bottom, on the boundary line, and then set on fire. The fumes went in the opposite direction from the Magpie workings, were several men were at work, causing the death of three of them and serious injury to a good many more. Some of the men were tried on the charge of murder, and acquitted. Some few years ago also two men fell down the shaft of the Magpie, so that its history is by no means an uneventful one. It is, however, to be hoped that the good fortune which has attended the Magpie may be the means of leading to explorations in other localities, and with good results, for there is no reason to believe otherwise than that there are most valuable deposits of ore in Derbyshire that were within easy reach.

At the collieries business has been tolerably good, and next week it is expected that the question of limiting the output of coal will assume a tangible shape, and be presented by the men to their employers for their consideration. It certainly just now cannot be said to be a momentous question, for such is the state of the coal trade that in all probability in the course of a short time short time will be a necessity. House coal is the quality in which most is being done: but the weather has not been favourable for it, and of course it will continue to be less so. The demand for the London market has been but moderate, and prices have gone down of late, and a still further reduction looks by no means improbable despite the efforts of the men to stop the current by working only five instead of six days a week. The movement might have met with some little success had it been tried in the middle of winter or during the severest period of it; but to expect that during spring and summer the price of coal can be raised by some of the miners working a day less a week simply shows an amount of credulity that could scarcely be expressed at the present time. But they no doubt will be satisfied when they find that after a trial they have been

working against themselves, and that the philosophy they have been taught of late is a false one.

Steam coal is in but moderate request, excepting as regards the quantities required for the blast-furnaces in the county and the running contracts with the railway companies. In engine coal there has not been much change of late, there being a good deal of competition for this description of fuel, more especially in the Lancashire manufacturing districts. The iron trade of Derbyshire is in a healthy state, all things considered, so that there has been no falling off in the production of pig, for in addition to the large quantities that are being consumed at the local furnaces a steady business has been done with Lancashire and Staffordshire. At the rolling mills there has been a steady output of rolled material, but not to the extent that has been the case. The foundries are also looking better than they did, and there is now every appearance that as the season advances there will be plenty to do at most of them, especially in pipes, for which several of the works in Derbyshire have a high reputation both at home and abroad.

Sheffield manufacturers have been doing well, and there are no complaints heard in connection with the heavier branches of trade, for these as a rule are as busy as they well can be. In one or two of the minor branches, however, there has not been quite so much activity as was the case at the close of last year, still full work, even in such instances, is the rule. At Brown's and Cammell's they are still particularly busy in the new armour-plates, as well as in other descriptions of rolled iron. At both establishments there is a large quantity of Bessemer steel absorbed, for which there has to be a heavy importation of hematite pig from the Cumberland and other districts. Steel rails are still in good request, but contracts have to be taken at a low figure; and they are now being delivered on the Continent as low as 5*l*. 16*s*. per ton. Special qualities of Bessemer are now being largely produced for the production of cutlery tools and other material. The leading cutlery houses continue to be well employed, there being some good orders in hand for America and Australia, and Continental prospects are also looking better. Just now there is increased activity as regards the production of sheep-shears, and the output for the year promises to be more than usually heavy. Tool-makers are also doing well, and there is also plenty doing in razors, edge tools, and light fancy goods. In crucible steel there has been of late a marked increase in the production, and a large quantity is being used up by those engaged in casting and making miners' tools, wheels, tyres, and axles.

In the South Yorkshire district the coal trade is by no means active, whilst prices are barely remunerative—that is, they are such as merely prevents a loss. Siltstone coal at the pits only makes about 9*s*. per ton, and other qualities 7*s*. to 7*s*. 6*d*. per ton. In steam coal there has been a slight improvement, and rather more has been sent to Goole for shipment to several of the home ports. The exports from both Hull and Grimsby have, however, been rather quiet of late.

#### BASSET AND BULLER CONSOLS - STARTING AN ENGINE.

Practical miners have always stated that the adventurer should first choose the district in which good mines are situated before he lays out his money in a mining speculation, and if there is a district in the county of Cornwall which has a history for riches in times gone by surely it is that in which Buller and Bassett Consols are situated. Buller, Copper Hill, and East Bassett, which form the Consols, have returned in days gone by almost fabulous riches in copper ore, and, dying as they do under the shadow of Carn Brea Hill, where many mines that have proved rich for copper have turned out rich also for tin—Dolcoath being the leading example on one side—there may be said to be every reasonable hope that if these mines are prosecuted in depth they will also become valuable and profitable properties. And this is rendered all the more probable by the fact that the Great Flat tin lode running through the district has been discovered in Wheat Bassett in the north part of the sett, in West Bassett, West Frances, and other mines in the neighbourhood, proving beyond a doubt that this famous lode traverses Buller and Bassett. Through the assistance of Capt. R. Pryor a company has been formed to work them under the Limited Liability principle. Already a good deal of preliminary work has been done, especially at Copper Hill, where an efficient tin engine has been erected and started, under the direction of Mr. John Tonkin, engineer. There has also been a steam-whim and capstan put up, and a good deal of other work done, especially underground. At East Bassett also there has been considerable work done, and besides the present stamping-engine on this part of the property it is proposed to put up an 80-in. cylinder pumping-engine, to enable them to intersect the Great Flat lode, as they have done in the adjoining property, and so open up "a great storehouse of tin."

During the last three or four months the men employed on surface operations were greatly hindered by the wet weather, but they persevered in the most energetic manner to push on the work, and in recognition of their services Capt. R. Pryor gave them a dinner at East Bassett account-house on Saturday last, when he invited a number of friends to join him. Amongst those present were Mr. Tonkin, the engineer; Messrs. Samwell, Cornish, Boscombe, Harris, and F.G. Pryor; Capt. Hooper, James Pryor, Opie, &c.

After dinner, Capt. R. Pryor, who occupied the chair, proposed the usual loyal toast and the lord of the mine and his agents, whom he spoke of in the highest terms for their liberal and practical views in regard to mining. He also spoke of the former great riches of Buller Mine. There were no steam-whims used in early days, and horse were used for drawing from 120 to 130 fms. Things had altered since then, and they must continue to introduce more and more machinery. The Cornish miners were the best in the world, but they would soon refuse to work where machinery was not employed. He enlarged on the working of mines now compared with the inefficient appliances of former times.

In proposing "A better price for tin and copper," the CHAIRMAN said his heart had always been in mining. There was always something new and something to learn in it, and, no matter what part of the world mining operations were carried on, they would find Cornishmen at the head. They were not sufficiently paid in Cornwall, and hence they went elsewhere and made discoveries. The great advantage of the modern machinery was that it enabled them to develop their mines so much more quickly, and thereby they were better able to compete with the world. Formerly, mine agents had been very much prejudiced in various ways, and one was with regard to giving long contracts to men, but he thought the day was coming when they would be willing to give the men six or eight months' contracts—in, for instance, sinking a shaft by machinery, and a few pounds a month would be nothing compared with the progress that would be made.

Mr. TONKIN then gave "Success to Bassett and Buller Consols," coupled with the name of the Chairman.

Capt. PRYOR, in reply, referred to the rough weather which they had had recently, and to the pluck and perseverance which the men had shown under it. He was, therefore, very glad to meet them there that day to fulfil the promise which he had made for their extra efforts. After East Bassett had ceased to work he purchased the whole of the plant and machinery, as he had had a large stake in it previously, and he thought where he had lost money was the best place to get it again. He worked a quarter part of the mine for more than 12 months himself. He had succeeded, after some difficulty, in getting the sets of the adjoining mines; and, looking at what had been done on the Great Flat lode in adjoining mines, he thought there was a great future before them, keeping in view the fact that, as in Dolcoath, the deeper they went the richer the mines would become. If they lived for 50 years more that district would, according to his opinion, be considered in its infancy. (Applause.) It had been 100,000*t*. he would go and invest it in purchasing an 80-in. engine and sink down at once in East Bassett, and give men a contract to intersect the Great Flat lode, and when that was done their children's children would not see the end of the riches in that mine. The reason why outsiders did not like the Cost-book System was that a good many had been pinched a bit by being mixed up with people that had possessed but little money, and had also to pay liabilities which should have been shared with them by others. He did not see why the Limited Liability principle should not be worked as well as the Co-st-book system. He was, therefore, very glad to meet them there that day to fulfil the promise which he had made for their extra efforts. After East Bassett had ceased to work he purchased the whole of the plant and machinery, as he had had a large stake in it previously, and he thought where he had lost money was the best place to get it again. He worked a quarter part of the mine for more than 12 months himself. He had succeeded, after some difficulty, in getting the sets of the adjoining mines; and, looking at what had been done on the Great Flat lode in adjoining mines, he thought there was a great future before them, keeping in view the fact that, as in Dolcoath, the deeper they went the richer the mines would become. If they lived for 50 years more that district would, according to his opinion, be considered in its infancy. (Applause.)

Referring to Mr. Peter Watson, the CHAIRMAN said that gentleman had formerly a large interest in the mines in the west of the county. He was a practical miner, and knew all about mining, and he liked to see such gentlemen coming down into the county, as it was a pleasure to talk to them. Mr. Watson had brought a vast amount of money into the county, but some time ago he took his interest from the western part of the county and placed it in the eastern, and brought out some valuable properties, but now he had come back to the west again, and had taken a large interest in South Frances, and at the meeting before last he made some very important remarks. Mr. Watson was a strong supporter of the Limited Liability principle, knowing as he did that people outside were afraid of the Cost-book System, many having been severely bitten by it, himself included.

"The Health of the Working Miners" was proposed by the CHAIRMAN, and in response they gave three cheers for Capt. Pryor and Buller and Bassett.

Capt. HOOPER, responding to the toast of "Neighbouring Mines," said, from present appearance at the bottom of East Uny, they had to cut a good bunch of ore, which would reward the shareholders for their outlay. They had not done anything on the best tin ground yet on account of the water, but they were going to erect an engine at Clijsh to fork the mine, and he had no doubt it would do. (Applause.)

Mr. SAMBELL said there was one lode which had not been mentioned, which was likely to be a great benefit to them if they opened on it, and that was Wen-worth's lode in Clijsh. It had proved a good lode in the shallow levels, especi-

ally east of the shaft; and why should it not be as good in Copper Hill and East Bassett as it was there? He had very great faith in that lode.

Mr. TONKIN, in reply to the toast of his health, said he believed that Cornwall in times past had not only suffered from lack of mechanical appliances, but from imperfect machinery. There was no doubt in the world that the time had come when they should do very much better in that respect, for they were gradually waking up to the fact that they were very much behind. He had known that district for the last 25 years, and had studied it a little, and he considered that when they were in such a district the risk of failure was reduced to a minimum. It was one of the richest in Cornwall. One of the reasons why Cornish mining had been under a cloud was that capital had been diverted into gold mining in India, which he felt certain would result in failure to a great extent; and if a quarter part of the capital which had been sent to India had been expended in Cornish mining it would have been far more profitable. The old miners that had passed away had been eminent Conservative, but the present agents met together and exchanged their views, and this had resulted in great benefit, as it had convinced people outside that they were doing their best to develop the mines. If mine agents had not laid hold of recent improvements the best mines in the county would be losing money. It was stated 25 years ago that Cornish mines could not be worked at 300 fms. deep, as the chains would break with their own weight. They could work 400 fms. with ease, but what another 400 fms. would do it was impossible to say, but he did not fear that they could work at even that depth, nor did he believe that the world was coming to an end yet. He believed in working mines on a large scale, because the standing charges were the same whether they returned much or little ore. He congratulated the shareholders on what has been done there, and he believed they would be rewarded for their outlay. There was a great unanimity of opinion as to Copper Hill and East Bassett, and their chances had been very much enhanced by recent discoveries in the neighbouring mines. (Applause.)

#### PROVINCIAL STOCK AND SHARE MARKETS.

**CORNISH MINE SHARE MARKET.**—Messrs. ABBOTT and WICKETT, stock and share brokers, Redruth (Jan. 25), write:—The market has been sluggish during the past week. A moderate business in East Pool and Dolcoath, but most other shares have been neglected, and prices as a rule are easier. Tin standards reduced 2*l*. to-day. Subjoined are the closing quotations:—Blue Hills, 1*l* to 1*l*; Camborne Vean, 6*s* to 1*l*; Carn Brea, 8*s* to 8*l*; Cook's Kitchen, 35*s* to 36*s*; Dolcoath, 6*s* to 6*l*; Devon Consols, 5*s* to 5*l*; East Caradon, 6*s* to 6*l*; East Pool, 50*s* to 50*l*; Killifretch, 3*s* to 3*l*; New Cook's Kitchen, 6*s* to 6*l*; New Kitty, 2*s* to 2*l*; Old Gunnislake, 6*s* to 6*l*; Pedn-an-drea, 2*s* to 2*l*; Penhalls, 6*s* to 6*l*; South Condurrow, 9*s* to 9*l*; South Crofty, 10*s* to 10*l*; South Poldice, 6*s* to 6*l*; West Kitty, 12*s* to 12*l*; West Peavor, 7*s* to 7*l*; West Frances, 6*s* to 7*l*; West Tolgois, 15*s* to 17*l*; West Seton, 16*s* to 18*l*; Wheal Agar, 16*s* to 17*l*; Wheal Bassett, 7*s* to 7*l*; Wheal Grenville, 7*s* to 7*l*; Wheal Hony, 4*s* to 4*l*; Wheal Uny, 5*s* to 5*l*.

—Mr. J. H. REYNOLDS, stock and share broker, Redruth (Jan. 25), writes:—There has been little or nothing doing in the share market for the past week, with the exception of Dolcoath, which keep firm at quotation. The standards have been reduced to-day 2*l*. per ton. Subjoined are the closing quotations:—Blue Hills, 1*l* to 1*l*; Carn Brea, 8*s* to 8*l*; Cook's Kitchen, 35*s* to 36*s*; Dolcoath, 6*s* to 6*l*; Devon Consols, 5*s* to 5*l*; East Caradon, 6*s* to 6*l*; East Pool, 50*s* to 50*l*; Killifretch, 3*s* to 3*l*; New Cook's Kitchen, 6*s* to 6*l*; New Kitty, 2*s* to 2*l*; Old Gunnislake, 6*s* to 6*l*; Pedn-an-drea, 2*s* to 2*l*; Penhalls, 6*s* to 6*l*; South Condurrow, 9*s* to 9*l*; South Crofty, 10*s* to 10*l*; South Frances, 7*s* to 8*l*; Tincroft, 7*s* to 7*l*; South Poldice, 6*s* to 6*l*; West Kitty, 12*s* to 12*l*; West Peavor, 7*s* to 7*l*; West Frances, 6*s* to 7*l*; West Tolgois, 15*s* to 17*l*; West Seton, 16*s* to 18*l*; Wheal Agar, 4*s* to 4*l*; Wheal Bassett, 7*s* to 7*l*; Wheal Grenville, 7*s* to 7*l*; Wheal Hony, 4*s* to 4*l*; Wheal Uny, 5*s* to 5*l*.

—Mr. M. W. BAWDEN, Liskeard (Jan. 25), writes:—The mining market presents one dull and monotonous feature, most of the leading shares are offered at a slight reduction on last week's prices. A reaction will probably take place after the Banca sale on Tuesday next, and higher rates obtainable. Herdfoot and Marke Valley find buyers at present low prices. Subjoined are the closing quotations:—Bedford United, 1*l* to 1*l*; Carn Brea, 8*s* to 8*l*; Cook's Kitchen, 34*s* to 35*s*; Dolcoath, 6*s* to 6*l*; Devon Consols, 5*s* to 5*l*; East Caradon, 6*s* to 6*l*; East Pool, 50*s* to 50*l*; Glasgow Caradon, 6*s* to 6*l*; Gawton United, 6*s* to 6*l*; Gunnislake (Clitters), 2*s* to 2*l*; Herdfoot, 6*s* to 6*l*; Hingston Down, 6*s* to 6*l*; Killifretch, 3*s* to 3*l*; Marke Valley, 6*s* to 6*l*; New West Caradon, 6*s* to 6*l*; North Pool, 50*s* to 50*l*; Old Gunnislake, 6*s* to 6*l*; Phoenix United, 2*s* to 2*l*; Prince of Wales, 6*s* to 6*l*; South Devon United, 6*s* to 6*l*; South Condurrow, 9*s* to 9*l*; South Crofty, 10*s* to 10*l*; South Frances, 7*s* to 8*l*; Tincroft, 7*s* to 7*l*; West Bassett, 6*s* to 6*l*; West Frances, 7*s* to 7*l*; West Kitty, 12*s* to 12*l*; West Peavor, 5*s* to 6*l*; West Poldice, 6*s* to 6*l*; West Seton, 16*s* to 17*l*; Wheal Agar, 16*s* to 16*l*; Wheal Bassett, 7*s* to 8*l*; Wheal Crebore, 2*s* to 2*l*; Wheal Grenville, 7*s* to 7*l*; Wheal Hony, 4*s* to 4*l*; Wheal Jane, 6*s* to 6*l*; Wheal Peavor, 4*s* to 4*l*; Wheal Uny, 5*s* to 5*l*.

—Mr. JOHN CARTER, mine share-dealer, Camborne (Jan. 25), writes:—The share market has again been very dull, and prices generally show a further decline. The tin standards are reduced 2*l*. to-day. Closing quotations are annexed:—Carn Brea, 8*s* to 8*l*; Cook's Kitchen, 35*s* to 36*s*; Dolcoath, 6*s* to 6*l*; East Pool, 50*s* to 50*l*; Killifretch, 3*s* to 3*l*; Mellanearc, 4*s* to 4*l*; New Cook's Kitchen, 6*s* to 6*l*; New Kitty, 2*s* to 2*l*; Pedn-an-drea, 2*s* to 2*l*; Penhalls, 6*s* to 6*l*; South Condurrow, 9*s* to 9*l*; South Crofty, 10*s* to 10*l*; South Frances, 7*s* to 8*l*; Tincroft, 7*s* to 7*l*; West Bassett, 6*s* to 7*l*; West Frances, 7*s* to 7*l*; West Kitty, 12*s* to 12*l*; West Peavor, 5*s* to 6*l*; West Poldice, 6*s* to 6*l*; West Seton, 16*s* to 17*l*; Wheal Agar, 16*s* to 16*l*; Wheal Bassett, 7*s* to 8*l*; Wheal Crebore, 2*s* to 2*l*; Wheal Grenville, 7*s* to 7*l*; Wheal Hony, 4*s* to 4*l*; Wheal Jane, 6*s* to 6*l*; Wheal Peavor, 4*s* to 4*l*; Wheal Uny, 5*s* to 5*l*.

—Mr. S. J. DAVEY, mine share-dealer, Redruth (Jan. 25), writes:—Our market has been very flat throughout the week; Dolcoath and East Pool have both declined, while for many other mines quotations are not maintained in the absence of buyers. The tin standards were to-day reduced to 8*s*, 8*l*, and 9*s*, being a reduction of 2*l*. Closing quotations herewith:—Carn Brea, 8*s* to 8*l*; Cook's Kitchen, 35*s* to 36*s*; Dolcoath, 6*s* to 6*l*; East Pool, 50*s* to 50*l*; Killifretch, 3*s* to 3*l*; Mellanearc, 4*s* to 4*l*; New Cook's Kitchen, 6*s* to 6*l*; New Kitty, 2*s* to 2*l*; Pedn-an-drea, 2*s* to 2*l*; Penhalls, 6*s* to 6*l*; South Condurrow, 9*s* to 9*l*; South Crofty, 10*s* to 10*l*; South Frances, 7*s* to 8*l*; Tincroft, 7*s* to 7*l*; West Bassett, 6*s* to 7*l*; West Frances, 7*s* to 7*l*; West Kitty, 12*s* to 12*l*; West Peavor, 5*s* to 6*l*; West Poldice, 6*s* to 6*l*; West Seton, 16*s* to 17*l*; Wheal Agar, 16*s* to 16*l*; Wheal Bassett, 7*s* to 8*l*; Wheal Crebore, 2*s* to 2*l*; Wheal Grenville, 7*s* to 7*l*; Wheal Hony, 4*s* to 4*l*; Wheal Jane, 6*s* to 6*l*; Wheal Peavor, 4*s* to 4*l*; Wheal Uny, 5*s* to 5*l*.

—Mr. G. E. COOPER, stock and share broker, Redruth (Jan. 25), writes:—Our market has been very flat throughout the week; Dolcoath and East Pool have both declined, while for many other mines quotations are not maintained in the absence of buyers. The tin standards were to-day reduced to 8*s*, 8*l*, and 9*s*, being a reduction of 2*l*. Closing quotations herewith:—Carn Brea, 8*s* to 8*l*; Cook's Kitchen, 35*s* to 36*s*; Dolcoath, 6*s* to 6*l*; East Pool, 50*s* to 50*l*; Killifretch, 3*s* to 3*l*; Mellanearc, 4*s* to 4*l*; New Cook's Kitchen, 6*s* to 6*l*; New Kitty, 2*s* to 2*l*; Pedn-an-drea, 2*s* to 2*l*; Penhalls, 6*s* to 6*l*; South Condurrow, 9*s* to 9*l*; South Crofty, 10*s* to 10*l*; South Frances, 7*s* to 8*l</i*

Stock of copper contained in other foreign ore and Spanish precipitate, 3017 tons fine, against 1630 tons Jan. 14, 1882. Stock of Chilli bars and ingots in Havre, 2294 tons fine, against 2760 tons Jan. 14, 1882. Stock of Ooro Ooro Barrels in Havre, 11, against 25 tons January 14, 1882. Stock of copper other than Chilli in Havre, 120 tons fine, against 575 tons Jan. 14, 1882. Stock of Chilli copper affect and chartered for to date, 11,561 tons fine, against 9250 tons Jan. 14, 1882. Stock of foreign copper in London, chiefly Australian, 4446 tons fine, against 6200 tons Jan. 14, 1882.

According to the Board of Trade Returns the total imports and exports into and from this country for the following years were:

	1880.	1881.	1882.
Copper in ores	Tons 12,980 ...	13,343 ...	13,424
Copper reguiss and precipitate	26,194 ...	26,749 ...	28,784
Bars, cates, and ingots	36,509 ...	32,170 ...	35,509
In pyrites, estimated	16,447 ...	13,551 ...	15,673
Total	82,130 ...	85,813 ...	93,390
EXPORTS.			
English copper—wrought and unwrought	Tons 31,783 ...	34,698 ...	28,475
Yellow metal	14,895 ...	13,790 ...	12,818
Total	63,659 ...	65,054 ...	59,447

## Registration of New Companies.

The following joint-stock companies have been duly registered—

**THE "GLENMOWAN" STEAMSHIP COMPANY (Limited).**—Capital 50,000*l.*, in shares of 250*l.*. The purchasing, owning, and working of said steamship. The subscribers (who take one share each) are—J. Bradford, Morecambe; H. Heaton, Bradford; J. Stevenson, Shipley; G. Milner, Bradford; T. Hodgson, Bradford; J. P. Lindsay, Wallbridge; J. S. Grace, Tynemouth.

**THE ABERCARN COAL COMPANY (Limited).**—Capital 100,000*l.*, in shares of 10*l.*. The searching for, raising, and mining of coal, Cannel, slack, ironstone, clay, and any other minerals, ores, and substances in the United Kingdom, and the selling and disposing of the same respectively. The manufacture and sale of coke, and every product of coal, shale, and coke, and smelting and converting into metal any ores and mineral obtained from any of the lands in the possession of the company. The subscribers (who take one share each) are—J. H. Burn, Tynemouth, coalowner; D. Mackintosh, 10, Lancaster-road, M.D.; E. H. Watts, jun., Newcastle-on-Tyne, shipowner; E. H. Watts, 85, Gracechurch-street, shipowner; L. Wiese, 9, Mincing-lane, merchant; F. S. Watts, 85, Gracechurch-street, shipowner; J. H. Johnston, 25, Billiter-street, merchant. The directors will be appointed by the subscribers, who will in the first place act as such.

**THOMAS ARNALL AND COMPANY (Limited).**—Capital 3000*l.*, in shares of 17*l.*. To purchase a business of wire workers, coopers, and general dealers in mine and other materials carried on by T. Arnall under the name and style of the Tolgus Trading Company, at Tolgus, near Redruth, Cornwall, and to do all things necessary and incidental to the attainment of the above object. The subscribers (who take one share each) are—T. Arnall, Redruth; H. Harris, Redruth; J. Chance, Germoe; J. Murgatroyd, Redruth; J. Evans, jun., Redruth; G. S. Reynolds, Redruth; T. H. Harwood, Redruth.

**A. D. MACLAY AND COMPANY (Limited).**—Capital 300,000*l.*, in shares of 10*l.*. The general business of a land company in connection with Australasia or elsewhere. The subscribers (who take one share each) are—G. Lordling, 17, Holford-square; J. C. Davis, Leyton; C. Barrett, Union-court Chambers; C. J. Barrett, Union-court Chambers; F. J. Tattershall, 160, Peckham Rye; T. Dickson, 139, Wilberforce-road; J. Lord, 11, Rutley Gardens.

**THE ANGLO-CALIFORNIAN WATERWORKS COMPANY (Limited).**—Capital 350,000*l.*, in shares of 10*l.*. To carry into effect an agreement made between the London Trust and Agency Company (Limited), of the one part, and Cecil Crosby Gordon, as trustee of the other, for the purchase and acquisition of the entire share capital of the Amador Canal and Mining Company, established at San Francisco. The subscribers (who take one share each) are—H. C. Philpot, Forest Hill; H. Roberts, Dunstan House; E. A. Dando, 2, Dane's Inn; C. B. Downes, 29, Bishopsgate-street Within; W. B. McTaggart, Naval and Military Club; J. Gregory, Blackwater; J. Vizetelly, 42, Old Broad-street.

**THE MONTANA COMPANY (Limited).**—Capital 600,000*l.*, in shares of 2*l.*. To carry on the business of miners and metallurgists, and to search for, win, get, mine, quarry, crush, smelt, wash, roast, dress, calcine, refine, buy, sell, and deal in ores, minerals, and metallic substances and compounds of all kinds, and in particular to acquire the Drum-Lummon Gold and Silver Mines, situated at Marysville, territory of Montana, United States of America. The subscribers (who take one share each) are—J. W. John, 90, Cannon-street, merchant; H. Dakin, 15, Walbrook, secretary; G. Smith, Hornsey, clerk; J. R. Pickering, 72, King William-street, accountant; J. A. L. Johnston, 30, St. Swithin's-lane, secretary; J. J. Ridley, 18, Draper's Gardens, solicitor; S. Pixley, 27, Old Broad-street, bullion broker. The following constitute the first board:—N. S. Maskelyne, M.P.; J. R. Armitage, Hon. B. Fitz-Patrick, M.P.; W. Holland, and T. Pyke. The number must not be less than five or more than eight.

**NINE GREAT WORK (Limited).**—Capital 30,000*l.*, in shares of 1*l.*. To adopt and carry into effect a certain agreement for acquiring the leases of and the working of the mines of tin, copper, and other metallic ores, situated at Germoe, county of Cornwall, together with all the mining plant, machinery, fixtures, ores, materials, chattels, and effects connected therewith, for the purpose of exploring and developing all such mines and mineral properties. To wash, dress, reduce, smelt, and refine tin, copper, iron, pyrites, gold, and silver, and to transport and sell such substances. The consideration of sale is 10,000*l.*—30,000*l.* cash, and the remainder in fully paid up shares. The subscribers are—J. W. John, 90, Cannon-street, merchant; T. Arnall, Redruth, merchant, 50*l.*; J. Manley, jun., Horrabridge, agent, 50*l.*; T. Rodda, Penzance, stationer, 20*l.*; J. Harris, Redruth, mine agent, 20*l.* The subscribers will appoint the first directors. Future directors must hold a qualification of 100 shares.

**THE MANCHESTER DIOCESAN BUILDINGS COMPANY (Limited).**—Capital 25,000*l.*, in shares of 5*l.*. The usual business of a building society. The subscribers (who take one share each) are—T. H. Birley, Pendleton; R. Tonge, Manchester; R. Phillips, Manchester; H. Charlewood, Manchester; H. Powell, Manchester; W. Egerton, Knutsford; J. Railton, Alderley Edge; S. Garnett, Pendleton.

**THE NORTHWICH CARRYING COMPANY (Limited).**—Capital 5000*l.*, in shares of 5*l.*. The general business of a carrying and towing company. The subscribers are—W. Vewall, Hartford, 20*l.*; J. Dobell, Northwich, 20*l.*; G. W. Dalton, Northwich, 20*l.*; J. Hassall, junior, Northwich, 20*l.*; J. Palin, Northwich, 10*l.*; T. Leicester, Northwich, 5*l.*; G. Capper, Anderton, 10*l.*; J. Ockleston, Knutsford, 5*l.*; T. Moor, Northwich, 20*l.*

**RICHARDS AND COMPANY (Limited).**—Capital 5000*l.*, in shares of 5*l.*. To acquire and carry on a business of makers and sellers of The Constitution Water. The subscribers are—G. F. Hough, Henley-in-Arden, 20*l.*; J. Tite, Henley-in-Arden, 20*l.*; C. E. Baggaley, Henley-in-Arden, 1*l.*; R. E. Cooper, Henley-in-Arden, 5*l.*; J. H. Sim, Henley-in-Arden, 1*l.*; P. P. Davenport, Birmingham, 1*l.*; C. F. Price, Birmingham, 1*l.*

**THE NEW CAKEMORE BLUE BRICKWORKS (Limited).**—Capital 120,000*l.*, in shares of 10*l.*. To carry on the business of brickmakers, colliery proprietors, coal and ironmasters, fireclay workers, and miners, or any other business usually carried on therewith. To work, raise, prepare for sale clays, marls, and other similar substances, and to convert same into bricks, tiles, drain-pipes, &c. To work, explore, and develop quarries, collieries, mines, and mineral properties, and to smelt and manufacture any ores, minerals, and other substances to be obtained from the proprietors of the company. The subscribers (who take one share each) are—J. C. Past, 33, New Broad-street, clerk; C. H. Fitzmaurice, Balham, agent; C. S. Champion Crespiigny, Members Mansion, esquire; F. C. Howard, 34, Fopstone-road, esquire; F. D. Webb, 18, Victoria-square, esquire; P. S. Borlase, the Guildhall, clerk; E. P. Thomas, 28, Lambeth-road, draughtsman.

**TANNER'S-LANE TANNING COMPANY (Limited).**—Capital 40,000*l.*, in shares of 100*l.*. To acquire and continue an established business at Warrington. The subscribers (who take one share each) are—

E. M. Crosfield, Warrington; S. M. Crosfield, Segwin; S. Reynolds, Latchford; C. Reynolds, Netherton; E. Davis, Warrington; W. Mortimer, Warrington; J. Axon, Latchford.

**THE JAMAICA TRADING COMPANY (Limited).**—Capital 5000*l.*, in shares of 10*l.*. The business of a mortgage and advance company in all branches. The subscribers are—T. O. M. Maycock, Babcombe, 140; E. M. Marshall, Babcombe, 2*l.*; R. Barrow, Newton Abbot, 20*l.*; W. B. Marshall, Beaumaris, 20*l.*; Lord H. D. Scott, Beauclerc, 10*l.*; H. C. Damant, West Cowes, 5*l.*; M. Damant, West Cowes, 5*l.*

**THE PURE WINE ASSOCIATION (Limited).**—Capital 5000*l.*, in shares of 1*l.*. To prepare, cleanse, and purify wines, or otherwise to use and deal with the same. The subscribers (who take one share each) are—C. N. Creswell, 1, Hare-court; W. Needhouse, Twickenham; A. F. Godson, 2, Pump-court; J. C. Gooden, 33, Tavistock-square; H. R. Perry, Isleworth; H. Briggs, Isleworth; F. G. Whitcham, 8, Drapers' Gardens.

**THE NATIONAL HORSE AND CARRIAGE INSURANCE COMPANY (Limited).**—Capital 100,000*l.*, in shares of 1*l.*. The subscribers are—R. Austin, 9, Bayley-street, 1*l.*; T. Vincent, Gypsy-hill, 1*l.*; F. Wakefield, Sydenham, 1*l.*; A. McEwen, 17, Great Winchester-street, 1*l.*; G. C. A. Kohler, 100, Leadenhall-street, 5*l.*; J. Lyns, 115, Cannon-street, 1*l.*; A. F. Gibbs, Stoke Newington, 1*l.*

**THE HEREFORD GREEN DRAGON HOTEL COMPANY (Limited).**—Capital 5000*l.*, in shares of 500*l.*. To carry on the business of said hotel. The subscribers (who take one share each) are—H. C. Beddoe, Hereford; F. Bodenham, Hereford; T. Canless, Hereford; P. B. Giles, Hereford; J. G. James, Hereford; T. R. Kempson, Hereford; T. Llamoarne, Hereford; H. Nevers, Hereford; W. Pulling, Ledbury; T. H. Maddy, Aberayron.

**THE MONMOUTHSHIRE STEAMSHIP COMPANY (Limited).**—Capital 19,500*l.*, in shares of 100*l.*. The purchasing, owning, and working of the said steamer. The subscribers (who take one share each) are R. E. Paynter, Newport; R. E. Getting, Newport; J. O. K. Getting, Newport; J. Barnes, Christchurch; T. Goldsworthy, Newport; H. Jayne, Newport; F. S. Hockaday, Newport.

## Lectures on Practical Mining in Germany.

### CLAUSTRAL MINING SCHOOL NOTES—NO. CCVIII.\*

BY J. CLARK JEFFERSON, A.R.S.M., WH. SC.,

Mining Engineer, Wakefield.

(Formerly Student at the Royal Bergakademie, Clausthal.)

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The following arrangement has been designed by Herr Büsche, of Schalke, for lessening the shock to the cage as it is landed at the bottom of the shaft. At a height of about 25 ft. above the landing boards the outer conductor of each pair is broken, the portion between this point and the bottom of the shaft being formed of I-iron, 6 in. deep. The upper end of this is hinged at the point above mentioned in such a manner that it can be swung in towards the opposite conductor, or out from it. The lower ends of these two hinged conductors are connected together below the landing boards by means of a tie rod, the length of which can be adjusted by right and left handed screws. In the centre of the pit, immediately beneath the tie rod, is placed a closed cistern nearly filled with water. The ends of the cistern are connected outside the cistern by means of a curved pipe, in which is fitted a cock. A vertical piston, hinged at its upper end, dips into the cistern, and reaches close to the bottom of the cistern, which is curved cylindrically about the axis on which the piston is hinged. A short lever keyed to this axis is attached at its upper end to the centre of the tie rod. The following is the working of the arrangement, supposing that the hinged conductor in that division of the shaft in which the cage is descending hangs towards the centre of the shaft, so that the distance between the conductors over the 25 ft. at the bottom of the shaft is less than the width between the surfaces of the guide shoes fixed to the cage. The hinged piston in the cistern is also inclined towards the side of the shaft in question, and is in its extreme position. As the descending cage enters the space between the hinged and fixed conductors it pushes the former outwards, moving the tie rod and the hinged piston, which forces the water in front of it, through the pipe, back again into the cistern of the behind piston. The resistance to the motion of the piston can be regulated by regulating the cock on the pipe through which the water flows. The motion of the hinged piston thus controls the motion of the hinged conductor through the tie bar, and the motion of the cage is controlled directly by the position of the hinged conductor. By regulating the cock, therefore, the speed of the descent of the cage close to the pit bottom can be checked at will. When the cage has reached the landing place, the opposite hinged conductor has been moved inwards, and the hinged piston has taken the opposite extreme position, the arrangement is thus ready to check the descent of the opposite cage. At the Hoppe shaft of the Abendstern Colliery, near Rosdzin, in Upper Silesia, an arrangement of spring beams is employed to support the flooring at the landing place at the pit bottom, which lessens the shock on the landing of the cage at the pit bottom.

### LOADING AND UNLOADING MULTIPLE DECK CAGES.

1.—The same level is used for all the decks. This is the most unsatisfactory of all the arrangements, though the simplest and at first the most generally used. The winding rope must be of such a length that when the lowest deck in the one cage is on a level with the rails at the landing place at the pit bottom, the upper deck in the other cage is on a level with the rails at the pit bank. When in this position the empty cages are withdrawn at the bottom and replaced by full ones, whilst at the pit bank the full ones are withdrawn and replaced by empty ones. When this has been done the engine must be started so as to raise the bottom cage from the caps, so that they may be withdrawn in order to allow the cage to descend. When the caps have been withdrawn the engine is reversed, and the bottom cage lowered, and the top cage raised a height equal to that of a deck, when the second deck from the bottom of the lower cage and the second deck from the top of the upper cage are unloaded and reloaded. These operations must be repeated for each deck, and the engineman at the top must wait each time for the signal from below. In many cases the inconvenience of moving the caps in and out for each deck is avoided by simply allowing the cages to hang freely suspended from the winding rope during the changing of the cages in the intermediate decks.

2.—A movable platform is provided at the pit bottom for the cage. The advantage of this arrangement is that the work at the top and bottom can be carried on independently. The winding rope must have sufficient surplus length that the cage at the bottom of the shaft may be in its lowest position, whilst the cage at the surface occupies its lowest position during the changing of the cages. When this arrangement is adopted the cage at the top is unloaded and reloaded with empty cages usually whilst the cage is suspended from the rope, being only placed on the fallers when the cages in the last deck are being changed. The movable platform at the bottom is connected with (a) an hydraulic balance, or (b) with balance weights.

(a).—The movable platform is connected with an hydraulic balance. In this arrangement the movable platform is fixed to the upper end of the ram or piston of an hydraulic cylinder. The lower end of the cylinder is connected with a vertical pipe, which is carried up some height close to the sides of the shaft. When the piston of the hydraulic cylinder is at the top of its stroke the cage is in its highest position for unloading. The stroke of the ram or piston of the hydraulic cylinder is such that in its lowest position the topmost deck of the cage can be unloaded. The cage comes to rest upon the movable platform. One platform and one hydraulic cylinder may suffice for both cages, or two platforms and two hydraulic cylinders may be used, one for each cage. The pressure against the underside of the ram or piston should be slightly less than the weight of the cage and platform, and the movable platform loaded with the cage and cages; in its highest position one of the cages is a full one. As

\* Being Notes on a Course of Lectures on Mining, delivered by Herr Bergarth Dr. von Grodeck, Director of the Royal Bergakademie, Clausthal, the Harz, North Germany.

the movable platform descends successively by the height of one cage, the weight of the movable platform, &c., gradually becomes greater as full cages are substituted for empty ones. Since the water is forced out of the cylinder into the pipe as the movable platform descends, the head of water thus becomes greater as the weight on the platform increases. The relative sectional areas of the pipe and the hydraulic cylinder should be so chosen that the head of water cannot increase to such an extent as to completely balance the movable platform, &c., before it has occupied its lowest position, otherwise an overflow opening must be made in the pipe, and a fresh quantity of water will be required every time the platform is raised and lowered. A cock is placed in some suitable part of the pipe so that the flow of water from the hydraulic cylinder can be regulated or stopped at will, bringing the movable platform to a standstill in any desired position for changing the cages. With the hydraulic arrangement as thus described the use of caps at the pit bottom becomes unnecessary.

(b).—The movable platform is balanced by weights. In this case, as in the above, the balance weights must be so arranged that the weight of the platform and cage, loaded with full cages in one deck, and empty cages in the remainder, shall be slightly greater than the balance weights, and the resistance offered by the friction of the machinery. As the platform descends the surplus of weight for moving the platform becomes greater, so that it is necessary to provide a brake to control the descent of the cage, though caps are used to support the cage in position when loading and unloading the various decks. The surplus weight for moving the platform may be kept constant by providing additional weights, which by means of projecting rests are prevented from descending beyond given positions, and which are successively taken up by the balance chains or ropes as the movable platform descends.

3.—The changing of the cages takes place from two or more decks at the same time. This arrangement is the most effective for saving time, though the details are different according to the number of decks. We shall consider first the case where two decks are employed. At the pit bottom the arrangements are such that the rails from the main roads are on a level with the rails of the upper deck, whilst the rails of the lower deck are on a level with the rails from a side shaft, in which a platform for the cages can rise and fall by the height of one deck; or the arrangements at the pit bottom may be such that the rails on one side of the shaft are higher than those on the other by the height of a deck, and these two lines of rails are connected by inclines. When arranged with a movable platform for the cages the platform is counterbalanced, the counter weight being greater than the platform with an empty cage, and less than the platform with a full cage. When the cage arrives at the pit bottom with empty cages in each deck, these are run out on to their respective levels, on which are standing full cages, which replace the empty ones. The empty cage from the higher deck is run at once into the roadway, whilst the cage from the lower deck is pushed on to the movable platform, and raised by the counterweights. Where inclines are provided the empty cages are run up these to the main roads, and thence to the workings. The full cages for the lower deck are lowered down the incline or on to the movable platform as described. Where the movable platform and counterbalances are employed a brake should be provided to regulate the rise and fall of the platform. A very similar arrangement is adopted at the pit bank.

**CARN CAMBORNE.**—In rising behind the end of the 95 fathom level, west of sump on the south lode, a good lode has been opened

## THE GENESIS OF ORE DEPOSITS.

The mode in which mineral veins were formed has long been an interesting subject of investigation among those engaged about mines, and the question is now very fully discussed in a monograph by Mr. Rudolf Keck, of Denver, Colorado, and a critical article upon it by Dr. Rossiter W. Raymond, published in the New York Engineering and Mining Journal. Dr. Raymond regards it as a suggestive attempt to generalise from known data, and also as a contribution to the data themselves. He does not agree with Mr. Keck's paper, but is glad to have the subject of ore deposits discussed from the stand-point of chemical geology; moreover, the importance of closer study and description of individual mines and mining districts is very great; and, as Prof. Posey has forcibly urged, a great deal of this sort of work must be done before safe generalisations will be possible. In consequence of the loose and heterogeneous character of the observations thousands of descriptions of mines and mining districts have added little to our theoretical knowledge.

Revelations previously unanticipated in geology were, says Mr. Keck, made 30 years ago by chemists, and more recently the microscope has led to a complete revolution in petrography. But a few years ago, Prof. F. Sandberger, at the University at Würzburg, Bavaria, himself a practical mining engineer, arrived at the conclusion, and followed it out, that substances which occur together in such close connection as vein-material and ores must logically have a similar origin. He separated the constituent silicates of rock (for instance, mica), and analysed them in much larger quantities than those generally used for analysis. The results were and still are quite astonishing. With the exception of tellurium, gold, and mercury, for which he could not get proper material for analysis, all the chemical elements occurring in ore veins have been detected in those silicates, undoubtedly demonstrating that not only the ingredients of the gangue, but also those of the ores, are contained in the eruptive rocks which often are the wall-rocks of veins, or occur in their vicinity. A further result of his laborious researches is the proof that these metallic contents are found in the silicates of crystalline rocks of all geological periods. We find ourselves, he continues, forced to believe in a causal connection between eruptive rocks and ore deposits, when, in the light of Prof. Sandberger's researches, we study the aspect of volcanic rocks and the transmutations they undergo subsequently to their first consolidation, by weathering, by exhalations of sulphuretted hydrogen, muriatic acid, and other gaseous emanations, by which they are converted from a hard to a soft clayey state, or are bleached and become porous, fissile, or honeycombed, until at length they crumble into a siliceous powder; when we observe the massive segregations of ores in eruptive rocks; when we take into consideration that those mountainous regions in which eruptive rocks are wanting contain the least ore deposits, and that the ore deposits occur more frequently in older than in the recent rocks, and are more common at the junction of various kinds of rocks than in the midst of large districts of a uniform rock; and that they usually occur in the latter case, only in case the rock is metamorphosed.

The entire material of all sedimentary rocks has been derived from the destruction and decomposition of former ones; thus it can be traced back to that region in our earth's crust from which the eruptive rocks were and are still arising. The Archean rocks are among those of all sedimentary periods, the richest in ores, not only because they show the mightiest development, but also because they have been longest exposed to volcanic and chemical activity. "They are the only universal formation, they extend over the whole globe, and were the floor of the ocean and the material of all emerged land when life first began to exist." In these rocks we have to acknowledge the visible origin of certain ores which we find, now-a-days, as secondary products in higher geological horizons. The fact that all minerals occurring in ore deposits could have originated in aqueous solutions; the drusy or combed texture of some ore deposits; the occurrence of minerals together with fragments of the wall-rocks in veins, a part of which appears to have been disintegrated by the action of water and friction; the omnipresence of water above and in our earth, especially during former geological periods; the absence of all indications of former intense heat within the ore deposits; the pseudomorphoses and other mineralogical phenomena; all these circumstances indicate that water was, and still is, the main agent in the mineralising process. All subterranean movements that produce joints and fractures in rocks, and the chemical action of the water circulating in our earth's crust, have given origin and peculiarities to ore deposits. In many cases it is evident that the origin of an ore deposit commenced with a more or less empty fissure caused by subterranean movements; but, in many other cases, this cannot be shown.

In explanation of the change of the silicates of metals contained in the eruptive rocks into sulphides, Mr. Keck states that the meteoric water on the surface of our earth carries free oxygen, nitrogen, and carbonic acid. Penetrating the upper parts of the earth, which are rich in decaying organic matter, the free oxygen produces carbonic acid, which is absorbed by the water; but this, on its way downward, takes up still more carbonic acid, which rises from the interior, and carries down also some organic substances, which reduce the sulphates of metals to sulphides. In this way the water effects the decomposition of a great many minerals by solution and precipitation. The results are carbonates, sulphates, sulphides, and silicic acid—becoming quartz afterwards—while the less soluble part mostly remains as silicates of alumina (clay) and magnesia (talc). The microscope has revealed the existence in abundance of minute cavities in eruptive rocks, in which water and salt, compressed carbonic acid, and sulphates are enclosed so hermetically that the water does not escape even when strongly heated. These substances are primitive constituents of such rocks, as well as the silicates. Therefore, it is probable that there were more of these substances present during the eruptions of the rock, especially also sulphuretted hydrogen, as we observe them during volcanic eruptions now-a-days. The same gas is produced by means of organic matter reducing the sulphates of alkalies to sulphides, which change the salts of metals to those of sulphides. Organic matter, however, still occurs in many veins, and Mr. Keck considers that it is an evident fact that in many mines the quantity and richness of the ores depend on the occurrence of organic matter, which is only the remains of larger quantities of it, present in a state of decay in former times. To this day, sulphuretted hydrogen is very common among the gas exhalations found on and in our earth, and is easily absorbed by the circulating waters therein. But if that organic matter did not contain more or less sulphur it could not, therefore, produce much sulphuretted hydrogen; and hence, in regard to ore-building, those sediments were more favourable which contained the remains of animal bodies; for instance, the upper bed of the blue limestone at Leadville. As the ultimate result of the leaching and crystallising process are found the different minerals constituting the gangue. Many dissimilar so-called vein formations are, in the main, but formations of different leaching periods.

The books only say that the fissures had been filled by mineral springs; but they do not tell how. There are many mineral springs carrying free carbonic acid, sulphates, sulphuretted hydrogen, or organic matter, arising from the salvages of ore veins, using the latter like other fissures as their shortest way to the surface of our earth. Hence, the conclusion was drawn that a causal connection may exist between these springs and the minerals in the vein. But Professor Sandberger had, several times, opportunities to pump out such springs, and to examine the fissures through which the springs were ascending; and he never found a single trace of a sediment on the walls, although they cause large sediments of minerals on the surface, where the air has access. Those springs, says Mr. Keck, have never caused the formation of a mineral vein; they have only carried off from them; but they cause precipitation and fixation of the precipitated sulphides, by filtering through a material offering a great surface. The miner has not very often to do with regular fissure veins; he rather has to take out his ores from more or less decomposed zones of rock containing ore segregations, or crossed by numerous little fractures filled with ores. The circumstances under which ore deposits

came into existence were manifest for physical and chemical reasons; but the process of ore deposition in itself was always the same. If a fissure strikes through different kinds of rock, it may contain their different leaching products. The same may be the case where fissures cross each other. In such instances a remarkable change in regard to the quality and quantity of ore may often be observed, and mostly a favourable change, because not only greater quantities, but also different characters of solutions met at such points; therefore, the chances for a denser precipitation and segregation were greater. It is well known that the same vein within the same wall-rocks may show a very different distribution of ores. This may be explained partly by the configuration of the footwall, forming synclines and anticlines (the former having a favourable, the latter an unfavourable influence on the deposition of ore); partly by the other irregularities in the fissure and on the wall-rocks; partly by dykes crossing the veins and checking the speed of the solutions; and partly by the different and more or less numerous affluents from the wall-rocks to the fissure. In this respect ore chimneys and ore pockets may be mentioned.

As we have to take it for granted that the metals contained in veins were principally contained as silicates in the eruptive rocks, as the chemical and physical process of ore deposition always was the same, and as the water penetrates all kinds of fractures and cavities, it will always be a useless attempt to establish classes of ore deposits on the basis of the kind of their metals and minerals, or on the basis of the form of the deposits. He cannot see any other essential distinction between the ore deposits than in the manner of their origin, either in consequence of fissures caused by subterranean movements, or without fissures, merely by solution, removal, and replacement of the material of their wall rocks. Thus we may divide ore deposits into three main classes:—1. Fissure veins; 2. Veins of replacement; and 3. Secondary deposits, having been derived from former deposits of segregations. The latter distinguish themselves from the other two classes by not showing periodical segregations of quartz, ores, and spars. To these belong, for instance, the ore beds deposited in the sedimentary formation, also the lead ore deposits of the Upper Mississippi, and at Raibl in the Austrian Alps, and the quicksilver deposits in California. Statistics show that the greater part of the mining in the world is done in the deposits belonging to the last two classes, not in fissure veins. It is strange to find in this country so much prejudice in favour of the fissure veins. He mentions only some of the most famous veins of replacement—those at Leadville, and at Christiania, in Norway; the celebrated Veta Madre, near Guanajuato, in Mexico (490 ft. thick, with ore pockets of from 100 to 130 ft. in thickness). The time will come when our successors will be enabled by the sum of certain coincidences of geological conditions to predict the presence of certain ore deposits. It will arrive so much the earlier, the more our mining engineers take pains to elaborate and publish monographs on mines and mining districts, and accompany them with correct maps and with statements furnished by competent analytical chemists and microscopists.

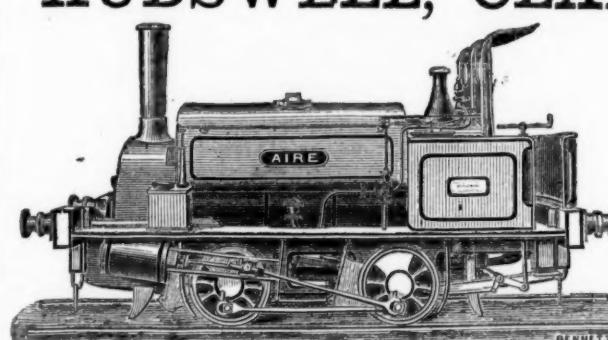
The agency of organic processes in the formation of ore deposits has, says Dr. Raymond, been lucidly explained by Prof. Sterry Hunt

with whose chemical and geological essays Mr. Keck does not seem to be familiar. It is eminently a work of redistribution and aggregation. But we do not think it can be made the agent of sulphatation. Nor do we agree with Mr. Keck in attempting to classify the ages of vein formation according to their mineralogical contents. The data are not sufficient as a basis for any such law. We differ again from Mr. Keck as to the invariable character of the process of ore deposition. At all events his statement is scarcely applicable to such various deposits as are actually known to the miner. Some light is perhaps thrown on it by Mr. Keck's proposed classification of ore deposits. He objects to distinguishing them according to their form or their contents, and proposes instead a classification based on a single feature in their history. Three classes, he says, cover all he can conceive—fissure veins, veins of replacement, and secondary deposits. This shows how much easier it is to criticise than to construct.

The systems which Mr. Keck condemns are at least good for something. It is convenient, if not scientific, to talk about gold, silver, copper, or lead deposits; it is convenient to speak of veins, beds, and masses; and we undertake to say that Mr. Keck never does and never could describe an ore deposit without including these features. But the system he proposes as a substitute is scarcely good for anything. Nearly all veins of replacement are enlargements of original fissure veins; the majority of fissure veins have been enlarged by processes of replacement; and the term secondary deposits, though a handy one for loose, popular description, can scarcely receive a scientific definition which would not include fissure veins and veins of replacement. Mr. Keck's own illustrations, says Dr. Raymond, condemn his system. He puts the Leadville mines under "veins of replacement," but the lead ore deposits of the Upper Mississippi and of Raibl in the Austrian Alps under "secondary deposits," to which class also he refers the quicksilver mines of California! We heartily agree with him in condemning "the absurd worship of fissure veins." But it is useless to deny that fissure veins afford, in their greater regularity of form, a certain guarantee of permanence which is wanting in some other kinds of deposits.

ENGINEERING REVIEW.—Technical literature has now become so extensive that the majority of working engineers and mechanics find it altogether impracticable to devote the necessary time to their perusal apart from any consideration of the expense of purchasing them. Mr. A. Tolhausen, of Manchester, therefore, renders them a valuable service in giving them in the Engineering Review (Manchester: Market-street) a condensed, but at the same time sufficiently complete abstract of the principal articles and papers in the leading journals devoted to mining and metallurgy, colliery, agricultural, gas and water, horological, marine, railway, sanitary, and general engineering. He states that what is often editorially span out into columns might with equal effect be condensed into half a dozen lines, and thus time be saved to the reader; this condensation he has undertaken, and he appears to have performed his task satisfactorily. The selections are judiciously made, and the arrangement is systematic and excellent.

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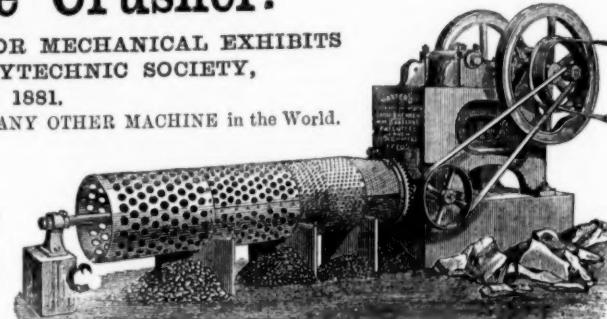
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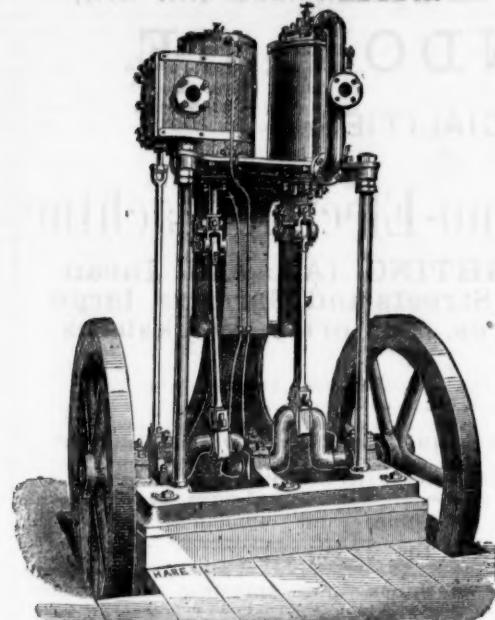
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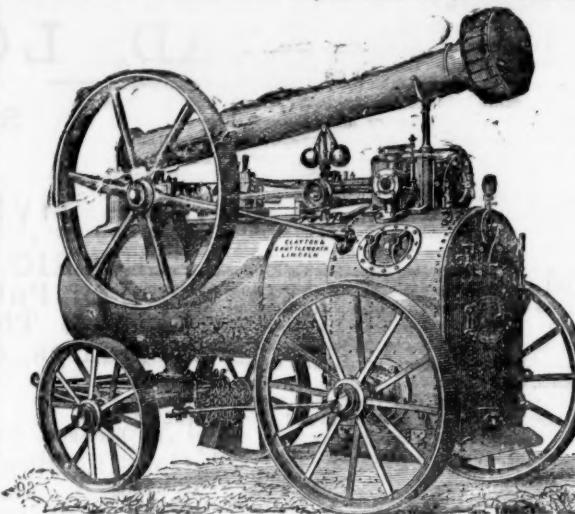
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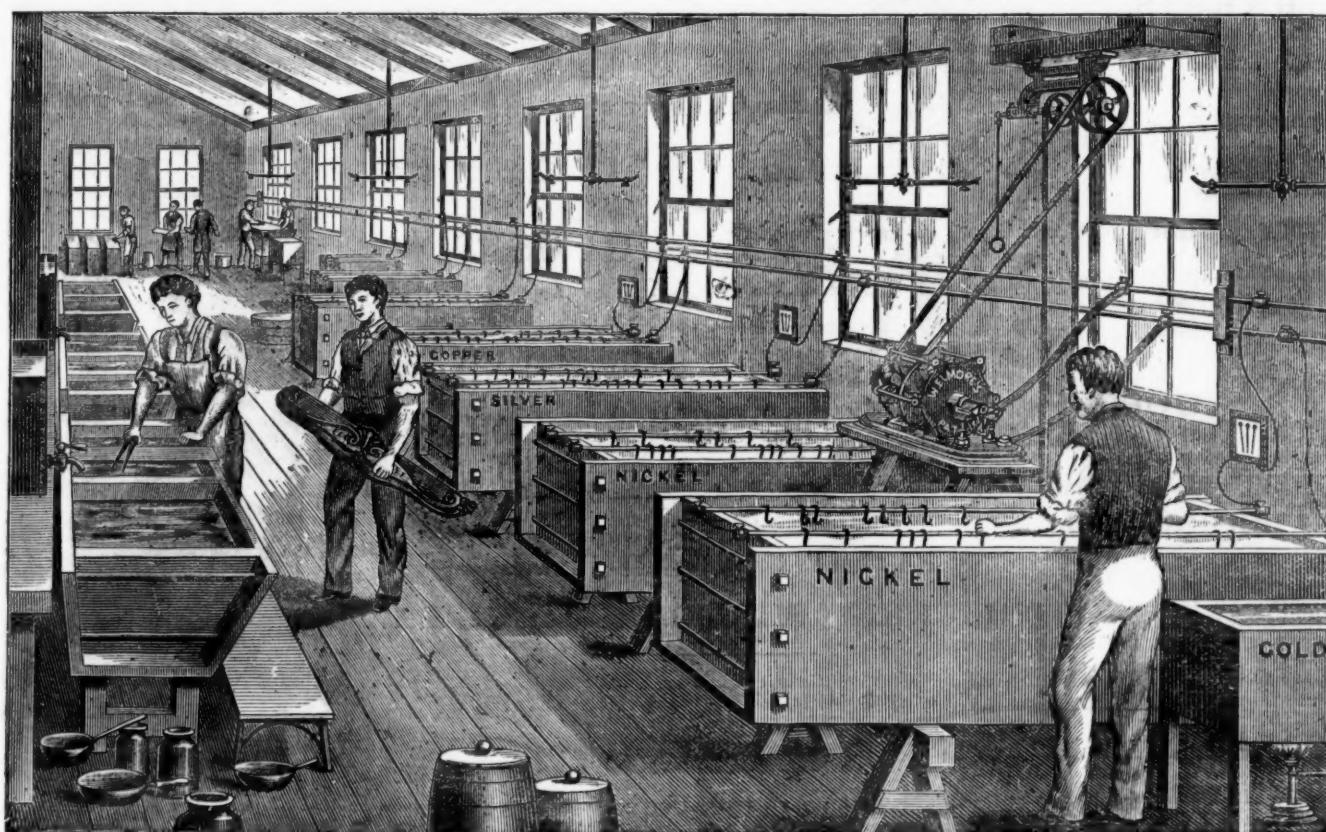
Complete Outfits. The “Elmore” Machines and appliance for GALVANIZING.

Complete Outfits. The “Elmore” Machines and appliance for REFINING METALS.

The “Elmore” Machines and appliance for EXTRACTING METALS FROM ORE,

The “Elmore” Machines and appliance for GENERATING OXYGEN, Hydrogen, Chlorine, Ozone, and other Gases.

COMPLETE WORKING OUTFITS SUPPLIED.



The above represents an Electro-Plating Works in which an “ELMORE” PATENT DYNAMO-ELECTRIC MACHINE is being used for the simultaneous deposition of Nickel, Silver, Copper, Bronze, Brass, Gold, Tin, Zinc, &c., from their Solutions.

**TESTIMONIALS, &c.**

## From the “HARDWARE TRADE JOURNAL”

## A MODERN PLATING ESTABLISHMENT.

“Mr. WILLIAM ELMORE, of 91, Blackfriars Road, London, S.E., is busily engaged fitting up the Art Metal Depositing Works of the Electrolytic Company, Charlotte Street, Blackfriars. The Electro-plating tanks of nickel, copper, brass, zinc, and tin, holding several thousands of gallons each (worked by an ‘Elmore’ Patent Dynamo-Electric Machine, capable of depositing about 500 lbs. of metal per day), and the specially designed and constructed polishing machinery will all combine to constitute this most gigantic and complete arrangement of the kind in the world. Here boiler tubes, each over 20 ft. in length, may be coated with copper, large ornamental iron lamp posts, and similar massive iron structural objects of great weight may be covered with electro-deposited copper, forming, when finished, a complete shell of bronze, which may be nickel-plated, or even silver-plated, if desired. Large rough or polished Iron surfaces may be coated with brass, or zinc, or tin. Copper electrotype copies are taken of art subjects, the reproduction being so perfect that the process is used for multiplying plates from which bank-notes are printed, and the most delicate ferns, flowers, leaves, and insects are coated with copper, and afterwards with gold, silver, nickel, &c., for use as ornaments of various kinds. Fenders, fire-irons, grates, &c., may be brassed. The largest marine engines may be nickel-plated in the large nickel-plating plant, worked by the powerful ‘Elmore’ machine with ease and certainty, which only a few months since would have been pronounced almost impossible. The Electrolytic Company, we understand, express perfect satisfaction with the work already completed by Mr. Elmore, and there is no doubt that with that gentleman’s large practical experience the company could not have been in better hands. The entire premises will be lighted by the ‘Elmore’ system of electric light.”

## From the “LONDON MINING JOURNAL”

“The new ‘Elmore’ Dynamo-Electric Machine can be seen in operation in London, and is considered one of the most wonderful scientific apparatus which has yet been brought before the public; it should be inspected by all who are interested in any kind of metallurgical operations.”

“Mr. ELMORE has just received two pieces of ordnance from Her Majesty’s Works at Chatham, with an order to nickel-plate the same, together with the carriages upon which they are mounted. Mr. Elmore has done similar work for the Government on previous occasions, and it will be remembered that the screw propellers used on the torpedo boats were nickel-plated by him. The ‘Elmore’ Dynamo-Electric Machines and complete electro-plating outfit have been supplied to Government Departments at home and abroad.”

Dynamo-Electric Machines, Outfits, &c., supplied to (London) Messrs. Thos. De la Rue and Co., Cassell, Petter, and Galpin, The India Rubber Company (Limited), Silvertown, The Nickel Plating Company, Joseph Woodricker, Kelly and Co., A. S. Cattell and Co., &c., &c., (Birmingham) Messrs. Wright and Butler, Joseph Woodward, The Griffin Gilding and Plating Company, and over 500 others.

## From the NICKEL PLATING COMPANY, 13, GREEK STREET, SOHO.

“Your Machine does its work most satisfactorily, and has never once reversed current, which the Weston Machine frequently did.”

## From the ELECTROLYTIC COMPANY,

## ART METAL DEPOSITING WORKS,

## CHARLOTTE STREET, BLACKFRIARS, LONDON.

“The ‘Elmore’ Dynamo-Electric Machine and entire outfit which you have supplied to this company have given perfect satisfaction.”

## From the NICKEL AND SILVER PLATING WORKS,

## 2, CHARLES STREET, CURTAIN ROAD, E.C.

“Having had one of the ‘Elmore’ Patent Dynamo-Electric Machines in constant use for several months, it gives me great pleasure to say that with it I have been able to deposit four times the weight of metal per day which I had been enabled to do with the Dynamo-Electric Machine, which it has displaced in my establishment.”

## From the LONDON NICKEL PLATING COMPANY.

“We have much pleasure in expressing our entire satisfaction with the nickel-plating solution, anodes, and Dynamo Machine that you have supplied us with.”

## From the DYNAMO-ELECTRIC PLATING WORKS,

## 2, OLD SWAN LANE, LONDON.

“The quality of the nickel solutions and anodes at these works, which were supplied by you, is most satisfactory in every way. The Dynamo Machine also works excellently, and has given no trouble whatever since it has been started.”

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PARIS EXHIBITION, 1878. GAINED THE GRAND PRIZE. THE TRIPLE AWARD. Gold Medal, Silver Medal, and Honourable Mention in competition with all the World.

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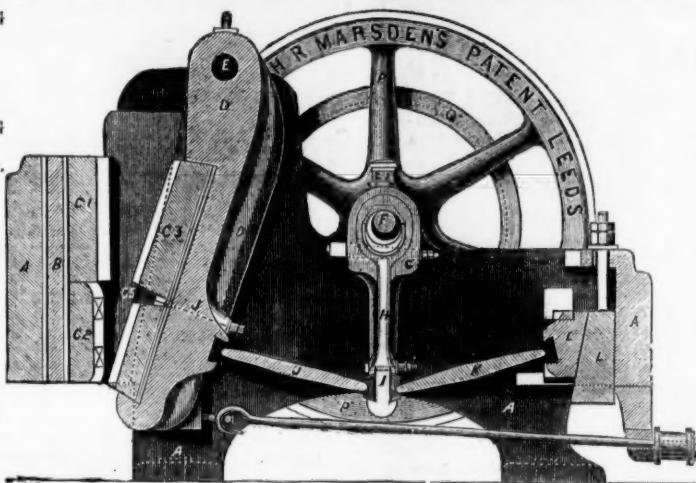
OVER 4000 IN USE.

### EXTRACT FROM TESTIMONIALS. PULVERISER.

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"The 15 x 8 stonebreaker gives perfect satisfaction. It produces more cubical stone than any others I have seen at work."

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"Your 10 x 7 crusher at the Aruba Gold Mines will crush 90 to 100 tons per 24 hours of the hardest gold quartz to 1" size."

"Some of your testimonials do not give your machines half their due. I have seen men hammering away on a big rock for a quarter of a minute, which your machine would reduce to the required size in a quarter of a minute. I would guarantee that your largest size machine would reduce more of the Cornish tin capels (which is the hardest rock of England) in a day than 200 men, and at 1-25th the cost."

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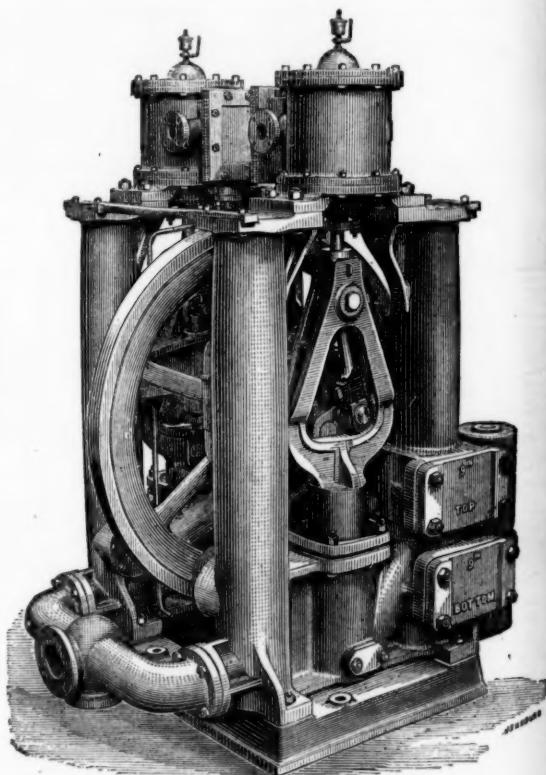
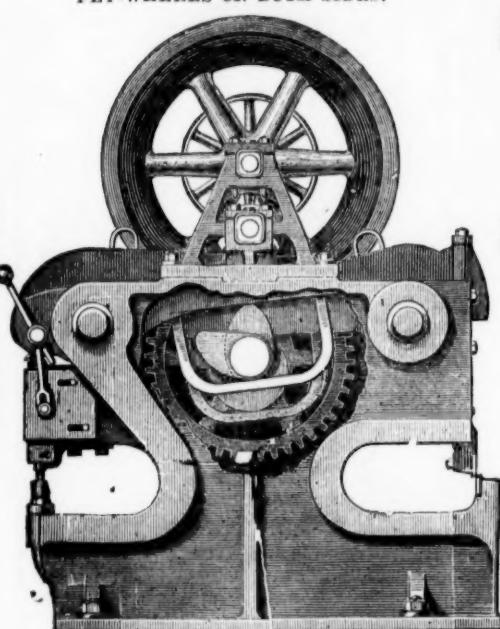
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